

Word Order and Anaphora

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WORD ORDER AND ANAPHORA

by

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Abstract

This thesis is about some linguistic forms or constructions relevant to human's information-management mechanism. This is based on the idea that human language is designed as information-managers.

In Chapter One we argue against the distinction between linguistic and extra-linguistic/cultural information. It is hard to distinguish linguistic information from extra-linguistic/cultural information. Linguistic information is a subset of extra-linguistic/cultural information, with fuzzy boundaries. In conversation or reading and writing, the speaker/writer always pays attention to what the hearer/reader knows. However, the speaker/writer cannot know the hearer/reader's knowledge in a direct way. Clark and Marshall (1981) proposed the way that the speaker accesses the evidence which the speaker and hearer can take for granted and calculates the mutual information based on the evidence. We adopt the way of calculation of mutual information proposed by Clark and Marshall, and suggest that some language forms and constructions (particles, anaphoric expressions, and "free" word-order phenomena) are accounted for in the model of information-management.

In Chapter Two we propose the model of human's memory system and information-management. As human's memory system, we adopt the multiple storage model. Human's memory system is divided into three different levels: working memory, episodic memory, and permanent semantic memory. Working memory is the level where the information retrieved or coming from the outside-world is processed. The information processed in working memory is stored in episodic memory. The information about conceptual and procedural meaning of lexical items is stored in the permanent semantic memory. We adopt the idea that information-processing is taken as a file-management. In the model of file-management, we proposed the notion of "folder". We assume that the speaker and hearer form a folder in their working memories in conversation. Introducing a new topic, keeping a topic, or reactivating an old topic are

taken as management instructions of folders in working memory.

In Chapter Three we try to account for some particles in Japanese in the model of information-management, proposed in Chapter Two. The particle *wa* is taken as a folder-activator. The function of *wa* is to reactivate a inactive or decayed folder in working memory. The final particles *ne* and *yo* are sensitive to the calculation to mutual information. The speaker attaches *ne* when (s)he has the evidence to hold mutual information, while (s)he attaches *yo* when (s)he has no evidence to hold mutual information.

Chapter Four treats anaphoric expressions in Japanese. We suggest that anaphoric expressions in Japanese are sensitive to different levels of memory storages. Zero pronouns, *ko*, and *so* are sensitive to working memory, *kare/kanojo* and *a* are sensitive to episodic memory, and bare nouns are sensitive to permanent semantic memory.

In Chapter Five we focus on "free" word-order phenomena in Japanese. The basic idea is that word order is derived from the speaker's adjustment of information-flow. We propose four principles of the adjustment of information-flow: Given-First Principle, From-Background-to-Foreground Principle, Salient-Order Arrangement Principle, and Focus-Marking Principle. Salient-Order Arrangement Principle is a default one: that is, if the speaker has no special intentions, word order is arranged from the most salient one to the least salient one. Given-First Principle is sensitive to the state of the speaker's working memory at a given time. The speaker tends to pick up the information in the working memory and to locate it in the sentence-initial position.

Chapter Six is concluding remarks.

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Chapter One

Linguistic and Extra-Linguistic

Information

1.0 Introduction

Every human being stores information or knowledge in his/her brain. It is innate or acquired through his/her experience. It has been argued that the information or knowledge that a human being stores are divided into two types. One is the "purely" linguistic information as to language; the other is the information as to the world. The meaning derived from the former is called "cognitive-meaning" or "sentence-meaning; and that derived from the latter is called "emotive-meaning" or "utterance-meaning". Linguists has insisted that the former is dealt with in the field of semantics, and that the latter, in the field of pragmatics. The "formal" linguists (e.g., generative grammarians) assume that there is a (clear) demarcation between the linguistic information and the extra-linguistic information, and insist that the interest of linguists is limited to the linguistic information, and that the work of linguists is to solve the content of the linguistic information. On the other hand, the "pragmatic" linguists assume that the linguistic information and the extra-linguistic information are indistinguishable, and insist that we should be interested in how we make use of various types of information when we use language. In this thesis, I would like to adopt the latter position. In this chapter below we show that the linguistic information and

extra-linguistic information are indistinguishable, and that it is important for the speaker to infer the mutual information of the speaker and the hearer.

1.1 Linguistic or Cultural Information

When we use or interpret language, we make use of various sorts of information. Linguists have distinguished information into the following sorts.

- (1) a. syntactic information
- b. phonological information
- c. (truth-conditional) semantic information
- d. lexical semantic information
- e. pragmatic information
- f. contextual information
- g. world/cultural information

The syntactic and phonological information is information as to specifying the possible set of orders (words or phonemes) of strings in a language. For example, in Japanese, (2a) is a possible word order, while (2b) is not; (3a) is a possible phoneme order, while (3b) is not.

- (2) a. 太郎が花子をぶった。

Taro ga Hanako o butta.

'Taro hit Hanako.'

- b. が太郎ぶったを花子。

*Ga Taro butta o Hanako.

- (3) a. /a/, /ta/, /tsu/

- b. */at/, */tt/

Japanese is a "head-final" language. This means that in Japanese, a verb is located in a sentence-final position, and a particle is suffixed to a noun phrase. Japanese is a "closed syllable" language. This means that in Japanese, a syllable is composed of a vowel, a consonant and a vowel, or the limited class of two consonants and a vowel. These types of information is involved in the brains of Japanese native speakers.

The (truth-conditional) semantic information is information as to calculating truth-value of a sentence. Cited here the "washed-out" examples in an introductory logic book.

- (4) a. All man is mortal.
- b. Socrates is a man.
- c. Socrates is mortal.

If we are given the premises of (4a) and (4b), we can deduct the conclusion of (4c) from them. This means that we involves the information as to calculating truth-value and determining whether deduction is valid or not.

The lexical semantic information is information as to co-occurrence of words.

Observe the following examples.

- (5) ?Colorless green ideas sleep furiously.

- (6) a. 鳥が飛ぶ。

Tori ga tobu.

'Birds fly.'

- b. ?本が飛ぶ。

?Hon ga tobu.

'Books fly.'

(5) is a famous example in Chomsky (1955). In (6), Japanese native

speakers judge (6b) as anomalous, because a verb *tobu* 'fly' selects as its subject an animal or machine that is able to fly. Such information is involved in Japanese native speaker's brain.

The pragmatic information is information as to preserving coherence in discourse. Observe the following example.

(7) A: レポート書いたの。

Repooto kaita no.

'Have you written a paper?'

B: うちのワープロ壊れてるんです。

Uchi no waapuro kowarete run desu.

'My word processor is broken.'

If we interpret the dialogue of (7) as coherent, we have to infer from the B's utterance that B has not written a paper. However, we face no difficulty to interpret the dialogue as (7). This means that information as to preserving coherence in discourse is involved in the brain.

The contextual information is information as to physical context or discourse.

Observe the following examples.

(8) A: (Looking at the ring put on B's finger)

どうしたの、それ。

Dooshita no, *sore*?

'What about it?'

B: ああ、これ、彼氏にもらったんだ。

Aa, *kore*, *kareshi ni motatta n da*.

'Oh, this is given to me by my boyfirnd.'

(9) 乾いた砂が^ガリトルバラの咽喉や肺を犯し、彼女は激しくせきこんだ。

Kawaita suna ga Ritorubara no inkoo ya hai o okasi, *kanojo* wa hageshiku sekikonda.

'The dry sand invaded Ritorubara's throat and lungs, and she had a fit of coughing.'

(*Nichibotus-mae ni hasshin seyo*, Ryu Mitsuse)

In (8), in order to determine the entity referred by *sore* 'that' or *kore* 'this', we have to know what exists and what the speaker and the hearer are paying attention to in the context. In (9), the entity referred by *kanojo* 'she' has been introduced in the preceding discourse. This means that we have to make use of the contextual information when we use or interpret language expressions.

The world or cultural information is information as to world or culture the speaker (and the hearer) lives in. Observe the following examples.

(10) a. We checked *the picnic supplies*. *The beer* was warm.

(Haviland and Clark 1974)

b. Mary stopped to look at *a house*. *The door* was opened.

c. I saw *a mast* in the harbor. *The boat* was coming.

(11) ?The river had been dry for a long time. Everyone attend the funeral.

(Breakmore 1992)

In (10), we can interpret that the beer is a part of the picnic supplies, and the door is the house's one, and the mast is the boat's one. These interpretations are based on our world/cultural information: e.g., a house has doors. According to Breakmore, (11) seems to be incoherent for a Westerner, while it is coherent for a speaker of Sissara (a Niger-Congo language spoken

in Burkina Faso and Ghana). Every Sissara speaker has the following information.

(12) If a river has been dry a long time, then a river spirit has died.

Whenever a spirit dies there is a funeral.

A Sissara speaker can make use of the information of (12), while a Western speaker cannot. This means that we have to make use of world or cultural information to interpret language expressions.

We have so far seen that we make use of various sorts of information when we use or interpret language expressions. In the (formal) linguistic literature, these sorts of information have been divided into two types: the first four sorts of information are linguistic information; the last three sorts of information are extra-linguistic information. However, this division is not clear. In what follows, I will show that the linguistic information is subsumed under the extra-linguistic information; in other words, the syntactic, truth-conditional semantic, and lexical semantic information is affected by the world or cultural information.

We first would like to focus on the lexical semantic information. Fillmore (1970) points out that selectional restrictions are not semantic but pragmatic. The example of (6b) is a violation of a selectional restriction. However, this is based on the information as to the world we live in. In the world we live, we believe that books are not able to fly. Thus, if we lived in the world where books can fly (e.g., the Wonderful World of OZ), we would judge the sentence like (6b) to be felicitous. Haiman (1979) presents an interesting example.

(13) (?)The rock is pregnant.

A Westerner or Japanese judges the sentence like (13) to be anomalous, because in the world we live, we believe that rocks are inanimate, and are not able to be pregnant. However, in the world of a myth, the Hittle story of the monster Uli Kummi, a rock does get pregnant. These examples show that lexical semantic information is based on the world or cultural information. The semantic anomaly wholly depends on the information of the world we assume that a given sentence is used in.

We will next focus on the truth-conditional semantic information. The interest of the truth-conditional semantics is whether truth is preserved or not. However, as pragmatists have been pointed out, there arise a question of by whom the truth is taken for granted or where (which world) it is taken for granted. In (14a), it is presupposed that Jack has children, but in (14b), such a presupposition is suspended.

(14) a. I'm sure that Jack's children are bright.

b. I'm sure that Jack's children are bright, if he has children.

So-called "world-creating" verbs can define other worlds as relevant for the evaluation of presupposition-involving constructions.

(15) I dreamed that Jack's child was injured in an accident.

(15) is valid if Jack has no children in fact. The presupposition that Jack has children is held in the world of the speaker's dream. These examples show that our valid deduction or inference is based on the speaker's assumption that the proposition said to be presupposed is true. In other words, presuppositions are something that speakers make.

We will last focus on the syntactic information. The formal syntacticians assume that the syntactic information is independent on the world or

cultural information. However, even Chomsky admits the distinguish between syntactic information and other information is difficult.

In other words, we must face the problem of determining to what extent the results and methods of syntactic or of semantic analysis can be extended to account for the deviance and interpretation of these expressions. It goes without saying that the same answer may not be appropriate in all of these cases, and that purely semantic or purely syntactic considerations may not provide the answer in some particular case. In fact, it should not be taken for granted, necessarily, that syntactic and semantic considerations can be sharply distinguished.

(Chomsky (1965; 77))

Syntactic conditions are not so rigid as syntacticians think. In fact, syntactic conditions are often violated in colloquial contexts. Observe the following examples of Japanese.

(16) あのう、いったい何なんですか、あれ？

Anoo, ittai nan nan desuka, are?

'Well, what on earth is that?'

(17) その子ね、例の三人目の適格者って。

Sono ko ne, rei no third children tte.

'He is a "third children", isn't he?.'

(Yoshiyuki, Sadamoto, *Sinseiki Evangerion*)

In the above examples, the phrase is dislocated to the sentence-final position; thus, the head-final constraint is violated. Morgan (1973) points out that the example of (18a) should be excluded from grammaticality on purely syntactic grounds, but it is felicitous in the context as (18b).

(18) a. Kissinger conjectures poached.

b. Does anyone know how President Ford like his eggs?

These examples show that even the syntactic information is based on the world or cultural information.

As shown in the above discussions, the linguistic information is not clearly distinguished from the extra-linguistic information. The linguistic information is a subset of the world or cultural information, with fuzzy boundaries. Thus, in this thesis, I do not distinguish linguistic and extra-linguistic information.

1.2 Mutual Information

In Section 1.1, we have argued against the distinction of the linguistic and extra-linguistic information. If the type of information is irrelevant to use language, what is relevant? In this section, we will introduce the notion of "mutual information", and show the idea that language is designed relevant to mutual information.

In conversation or reading and writing, the speaker/writer always pays attention to what the hearer/reader knows. However, the speaker/writer cannot know the hearer/reader's knowledge in a direct way, because human beings are not connected each other with cables, unlike computers. This means that in order to other's knowledge we have to infer or assume it. How do we infer or assume other's knowledge? Clark and Marshall (1981) point out that if we infer other's knowledge and try to hold mutual knowledge, we face a problem of limitless computations. If the speaker A tries to hold mutual knowledge about M with the hearer B, A assumes that B knows about M, and that B knows that A knows about M, and that B knows that A assumes that B knows that A knows about M, and so on. Clark and Marshall call this "Mutual Knowledge Paradox". It is implausible that a human being does such a limitless computations. To avoid the Mutual knowledge Paradox,

Clark and Marshall suggest the way that the speaker accesses the information which the speaker and hearer can take for granted and calculates the mutual knowledge based on the information. We adopt the idea of Clark and Marshall's, and call the information which the speaker and hearer can take for granted "mutual information."

Mutual information can be classified to some types. One is "physical co-presence". The speaker takes physical co-presence as the strongest evidence for mutual information. In conversation, the speaker shares the same situation with the hearer; thus, the speaker can take it for granted that the hearer pays attention to the thing or person which the speaker pays attention to. The use of deictic expressions is based on the physical co-presence. Japanese deixes *ko* and *so* are based on the speaker's assumption of mutual information in the conversational context. Repeat here the example of (8) as (19).

(19) A: (Looking at the ring put on B's finger)

どうしたの、それ。

Dooshita no, *sore*?

'What about it?'

B: ああ、これ、彼氏にもらったんだ。

Aa, *kore*, *kareshi ni motatta n da*.

'Oh, this is given to me by my boyfirnd.'

In (19), the use of *sore* 'that' and *kore* 'this' is warranted by the speaker's assumption that the hearer pays attention to the ring (with pointing at it with his/her finger).

We can take as mutual information what the speaker or hearer has said or

what the writer has written about. The speaker takes it for granted that the hearer knows not only what the hearer himself/herself has said but also what the speaker has said to the hearer. The writer takes it granted that the reader knows what the reader himself/herself has read. This assumption warrants the use of anaphoric expressions. Repeat here the example of (9) as (20).

(20) 乾いた砂がリトルバラの咽喉や肺を犯し、彼女は激しくせきこんだ。

Kawaita suna ga Ritorubara no inkoo ya hai o okasi, *kanojo* wa hageshiku sekikonda.

'The dry sand invaded Ritorubara's throat and lungs, and she had a fit of coughing.'

(*Nichibotus-mae ni hasshin seyo*, Ryu Mitsuse)

In (20), the use of *kanojo* 'she' is warranted by introducing it by the writer in the preceding discourse and the writer's assumption that the reader knows what the reader has read at that time.

If the speaker has enough evidence that the hearer belongs to the same "cultural" community, the speaker can take the information concerning the cultural community as mutual information. Consider the following cases. When I read a paper in a meeting of a linguistic society, I will say as (21a); but when I lecture on linguistics to college students, who know little about linguistics, I will say as (21b).

(21) a. チョムスキーはこう言っています。

Chomsky wa koo itte imasu.

'Chomsky said as follows.'

b. チョムスキーという人はこう言っています。

Chomsky toiu hito wa koo itte imasu.

When I read a paper in a meeting of a linguistic society, I have enough evidence that the audience belongs to the "linguistic community" and ones who belong to it knows about Chomsky. This assumption makes me use a "bare" noun form. On the other hand, when I lecture on linguistics to college students, I have no enough evidence that the students know about Chomsky. This makes me use a "indirect" noun form (noun + *toiu*). In the former case, mutual information can be held between the speaker and hearers, while in the latter case, mutual information cannot. This shows that a selection of linguistic expressions is relevant to mutual information. The use of *a* in Japanese is another example relevant to cultural information. When *a* is used, the speaker/writer has enough evidence that the hearer/reader belongs to the same cultural community, and can assume that the hearer/reader has ever seen or heard same events. Observe the following example.

(22) ほら、あの子、憶えてない。高校の時の…

Hora, *ano* ko, obaotenai. Kookoo no toki no ...

'Look. Do you remember that girl? When we are high school students, ...'

In (22), the speaker has enough evidence that the hearer knows the girl who the speaker want to talk about. The evidence is followed from the fact that the speaker and the hearer were the same high school students.

We have presented above that physical co-presence, conversational contexts, and information of cultural community are evidence to hold mutual information, and that mutual information is relevant to language items of

constructions.

1.3 The Certainty of Information

As long as the calculation of mutual information is based on the evidence that the speaker can access, the certainty of mutual information depends on the certainty of evidence. The speaker/writer tries to access stronger evidence in order to hold mutual information. Physical co-presence provides the strongest evidence to the speaker, while conversational contexts and information of cultural community provide less strong evidence to the speaker. Human memory decays as time goes by. It is not difficult to remember what has just been said, while it is more difficult to remember what has been said longer time ago. If the speaker/writer tries to access stronger evidence, (s)he access the information that has been given more immediately in the context. In fact, anaphoric items of human language are designed to be access "local" information (see Chapter 4).

However, the speaker/writer cannot always access the strongest evidence. (S)he sometimes can only access to the less strong evidence, and have to hold mutual information based on it. Modal auxiliaries are used to represent that the speaker has no strong evidence to a given information.

(23) a. He *may/must* be ill.

b. 彼は病気みたいだ/らしい/のようだ。

Kare wa byooki mitaida/rashii/noyooda.

In Japanese, final particles function the same role (see Chapter 3).

(24) 明日、言語学休講だよね/っけ。

Ashita, gengogaku kyuukoo da yone/kke.

'Will the lecture of linguistics be cancelled tomorrow?'

The final particle *yone* or *kke* signals to the hearer that the speaker does not have strong evidence to a given information; thus, the hearer is expected to provide stronger evidence to the speaker. In Japanese, "bare" constructions, constructions attached with no final particles, are used only to access the strongest evidence. This means that "bare" constructions is used to express the information concerning the speaker and the speaker's thought or internal emotion. Observe the following examples.

(25) 明日、言語学休講だ。

Ashita, gengogaku kyuukoo da.

'The lecture of linguistics be cancelled tomorrow'

(26) a. 寒い/暑い/おもしろい。

Samui/Atsui/Omosiroi.

'I feel cold/hot./I'm fun'

b. ?君が寒い/暑い/おもしろい。

?Kimi ga samui/atusi/omoshiroi.

'You feel cold/hot./You are fun.'

It is natural that (25) is said by a lecturer of linguistics, not by students. In (26a), the speaker's internal emotion can be perceived by the speaker himself/herself; thus, bare constructions are used naturally. On the other hand, in (26b), it is not easy for the speaker to get the evidence concerning the hearer's internal feeling; thus, bare constructions are not felicitous.

1.4 Toward the Model of Information-Management

In this chapter we have seen that human language is relevant to state of

information. This means that human language is designed as information-managers. If we construct the model of information-management, the model is suitable for human language. We will propose the model of information-management in Chapter 2. In the model we do not distinguish linguistic and extra-linguistic information. We do not assume that different types of information are stored in different storages. Our model is relevant not to types of information but to time of the storage of information: i.e., information stored just before or that stored long time ago. From Chapter 3 to 5 we will show that items or some constructions of human language are relevant to time of the storage of information.

Chapter Two

The Model of Human's Memory

System and Information-Management

2.0 Introduction

In conversation or reading and writing, we use language to convey and receive various sorts of information. We cannot talk or write about the things which we have never seen, heard, or read. We can only talk or write about the things which we have so far seen, heard, or read somewhere. In other words, when we talk to someone or write about something, we extract the information which is stored in our own memories. This means that human beings possess the "storehouses" of information in their brains. The goal of conversation or reading is to receive "new" or "unknown" information and to store it in the memory storehouse. However, we do not "directly" take the information which is entered in from the outside world or retrieved from the memory storehouse into the memory storehouse. During conversation or reading and writing, we are always engaged in the management of the incoming information.

We use the file metaphor to account for the management of information (see Heim (1983)). In the file management model, human beings store the information that (s)he has so far experienced as a collection of file cards.

The management of information is the metaphor of the management of file cards: to create a new file card, to store a file card into a filing system, to update the content of a stored file card, to retrieve a file cards from a filling system, and so on. Some particular linguistic devices, especially, anaphora and word-order changing, are used to do such management tasks.

2.1 The Multiple Memory Storage Model

The cognitive and neurological literature assumes that human's memory system is composed of multiple storages. We assume that there are (at least) three different levels of the memory storages: the working memory, the episodic memory, and the permanent semantic memory. A schematic representation of the relationship among the working memory, the episodic memory and the permanent semantic memory is given in Figure 1 below.

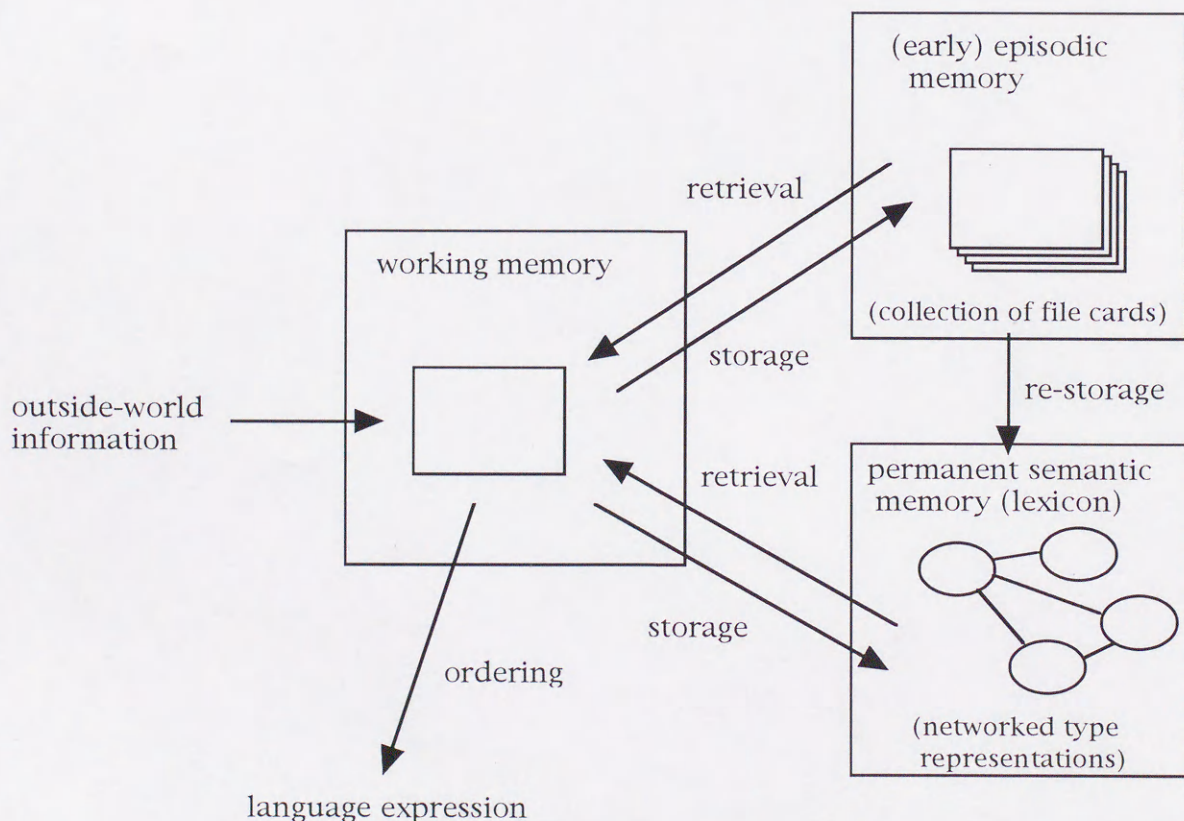


Figure 1. The model of multiple storage memory system

The outside-world information (language expression, vision, sound, and so on) is selected by sensory registers, and comes into the working memory. In the working memory, the incoming information is processed and entered on a file card. The information that an individual has so far seen or heard about is stored in the episodic memory as a collection of file cards. The information about conceptual and procedural meaning of lexical items is stored in the permanent semantic memory as type representations. The information in the episodic memory or permanent semantic memory is retrieved and processed in the working memory, and re-stored into the each storage levels.

2.1.1 Working Memory

It has been pointed out in cognitive and neurological literature that the capacity of working memory is limited. Miller (1956) assumes that the upper limit of processing information at a time is seven plus-minus two "chunks". In recent literature, the limit of capacity of working memory is taken as a limit of "processing resources" (see Just and Carpenter (1992)).

Human beings cannot pay attention to several things at a time. This is why the processing resources to process information are limited. If we pay attention to several things at any given time, we divide the limited processing resources to process several pieces of information. If we spent large amount of processing resources to process some information, we apply a little amount of processing resources to process other information. A little amount of processing resources causes poor interpretation.

In this thesis we will give attention only to language information (utterances or written texts). Language information is conveyed as a various "size" of

packages: a word, a cluster of words (a clause), a sentence, and a collection of sentence. Intuitively, we take a sentence as a basic unit of conveying language information. In the formal semantics, a sentence consists of a predicate and some arguments (and modifiers, if any).

(1) ジョンが部屋に入った。

John ga heya ni haitta.

'John entered into the room.'

The sentence of (1) consists of a predicate *hairu* 'enter' and two argument *John* and *heya* 'room'. In the working memory, the information conveyed as one sentence is entered onto one file card. If the speaker tell the hearer a sentence like (1), the content of the information conveyed by it is entered onto a (new) file card in the hearer's working memory. This means that we take a file card as a basic unit of language information. However, note that the amount of information entered on a file card is not limited to only one sentence. Observe the following example.

(2) ジョンは、部屋に入ると、コートを脱いで、ハンガーに掛けた。

John wa heya ni hairu to, kooto o nide, hangaa ni kake ta.

'John entered into the room, and put off the coat, and hung it on the hanger.'

(3) a. ジョンが部屋に入った。

John ga heya ni haitta.

'John entered into the room.'

b. ジョンがコートを脱いだ。

John ga kooto o nuida.

'John put off the coat.'

c. ジョンがコートをハンガーに掛けた。

John ga (sono) kooto o hangaa ni kaketa.

'John hung the coat on the hanger.'

The example of (2) consists of three sentences as shown in (3). However, each of the sentence represents not independent events but sequential one: i.e., the first event happens and the second event follows the first event and the third event follows the second event. We assume that one string of sequential events is entered onto one file card.

Furthermore, we assume that a subordinate (embedded) clause is entered on the same file card on which is entered its main clause.

(4) ジョンは部屋に入りながら、コートを脱いだ。

John wa heya ni hairi nagara, kooto o nuida.

'John put off the coat, entering into the room.'

(5) a. ジョンが部屋に入った。

John ga heya ni haitta.

'John entered into the room.'

b. ジョンがコートを脱いだ。

John ga kooto o nuida.

'John put off the coat.'

The example of (4) consists of a main clause, as (5b) and a subordinate clause, as (5a). Cognitively speaking, a subordinate clause conveys a background information with being described by a main clause. Just as a picture consists of figure(s) and background, so a file card consists of foreground information and background information (if any).

However, this does not mean that one file card is capable of containing infinite amount of information on it. Generative linguists often stress on the "productivity" of human [natural] language; that is, human beings involve the

(finite) system of producing infinite number of sentences that they have never heard. This system enables us to produce a longer sentence than a given sentence to embed it into another sentence. However, the everyday-sentence we use is limited to a certain length. This is why we cannot use a longer sentence beyond the amount of processing resources in the working memory. As long as a file card is created in the working memory, its capacity is limited by the processing resources in the working memory.

The limited capacity to process information in the working memory leads the tentatively-saved information to be finally-saved to other memory system.

We assume that as soon as a file card is filled with the information conveyed by a (string of) sentence, the file card is stored onto the (early) episodic memory.

There is one piece of evidence of taking one file card as a stored unit. Takubo and Kinsui (1996) observe that sentence-final particles function as a "monitor" of the state of information in the memory system.

(6) a. あなたは田中さんですか。

Anata wa Tanaka san desu ka?

'Are you Mr. Tanaka?'

b. あなたは田中さんですね。

Anata wa Tanaka san desu ne.

'You are Mr. Tanaka, aren't you?'

The speaker of these sentences asks the hearer for the certainty of the information that the hearer is Mr./Ms. Tanaka. The sentence-final particle *ka* or *ne* (with a raised intonation) functions as a monitor of whether the tentatively-saved information as a file card in the working memory may be stored in the episodic memory. In order to store a file card in the episodic

memory, all of the content on a file card is proved to be certain. The following example shows that the information stored in the long-term memory is not a clause (or sentence) unit but a whole eventual unit.

(7) 田中さんは部屋にはいって (*ね)、コートを脱ぎましたね。

Tanaka san wa heya ni haitte (*ne), kooto o nugi mashita ne.

'Mr. Tanaka entered into the room and put off the coat, didn't he?'

As shown in (7), the sentence-final particle appears in the event-final position, not in the clause-final position. This indicates that the cue of saving a file card in the episodic memory appears in the event-final position.

The main function of the working memory as a tentatively-information-saving level is to do a rapid access to activated entities. The information that is saved in the episodic memory is too "deep" to access; thus, to make the hearer access the episodic memory takes some costs. As long as we subject to the cooperative principle (cf. Grice (1975)), we avoid taking any cost, but for some special reason. The information in the working memory can be access rapidly. It decreases the hearer's cost and plays a role to maintain the activated entity (we will discuss this point in section 2.2).

To sum up, the working memory is (i) a level where the incoming information is entered on a file card, (ii) a level whose capacity is limited because of the amount of processing resources, and (iii) a "shallow" level where we can access the stored information with lower cost.

2.1.2 Episodic Memory

The episodic memory is a level where the information processed in the working memory is stored as a collection of file cards. The episodic memory contains the information that an individual has so far experienced. As

mentioned in section 2.1, in order to store a file card in the episodic memory, all of the content on a file card is proved to be certain. In other words, if a file card contains the "unproved" information, it cannot be entered into the episodic memory, and stays in the working-memory until all the content is proved to be certain. What is the "proved" information and the "unproved" information? Whether information is proved or unproved is a state of information. If the speaker has the evidence that it is certain that a given information is true, the information is proved. Akatsuka (1985) points out that some Japanese particles is sensitive to the state of information.

(8) A: ぼく、冬のLSAに行くことにしたよ。

Boku, huyu no LSA ni iku koto ni shita yo.

'I am going to the Winter LSA.'

B: 君が行くなら/*から、ぼくも行くよ。

Kimi ga iku nara/*kara, boku mo iku yo.

'If you are going, I'm going, too.'

(After the conversation with A, B says to the other person C)

B: AさんがLSAに行く*なら/から、ぼくも行くよ。

A san ga LSA ni iku *nara/kara, boku mo iku yo.

'I'm going to LSA because Mr. A is going.'

In (8), the speaker B is not certain that A is going to the LSA, although A said so. In this case, the "unproved" information is marked with the particle *nara*, not *kara*. On the other hand, after the information is stored in the episodic memory, it is marked with the particle *kara*, not *nara*. The proved information does not contain unspecified elements in it. In other words, referential variables (e.g., pronouns or demonstratives) must be assigned referential value before it is stored in the episodic memory (we will discuss

this point in Chapter 4). Note that whether information is proved or not is independent on whether information is truth-conditionally true or not, but rather depend on whether the speaker can access to evidence that (s)he is certain to be true; e.g., the speaker has seen the event happen with his/her own eyes, or the speaker has evidence to believe what the hearer has said.

The amount of information which is able to be stored in the episodic memory is larger and stays longer than that in the working memory. However, the episodic memory is not able to store the infinite amount of information eternally. We assume that the information stored in the episodic memory is periodically re-stored into the premanent semantic memory or the long-term/permanent episodic memory. The information re-stored in the long-term/permanent episodic memory is "compressed" or "cut down". The notion of "schema" (Rumelheart and Ortony (1977)), "frame" (Minsky (1975)), or "script" (Schank and Abelson (1977)), plays an important role to manage the information in the long-term/permanent episodic memory.

The content of a file card stored in the episodic memory is not stable, but updated constantly. The update of a file card is done in the working memory. A file card is retrieved from the episodic memory, and it is rewritten or new information is added to it in the working memory, and it is restored in the episodic memory. This is schematically represented as Figure 2 below.

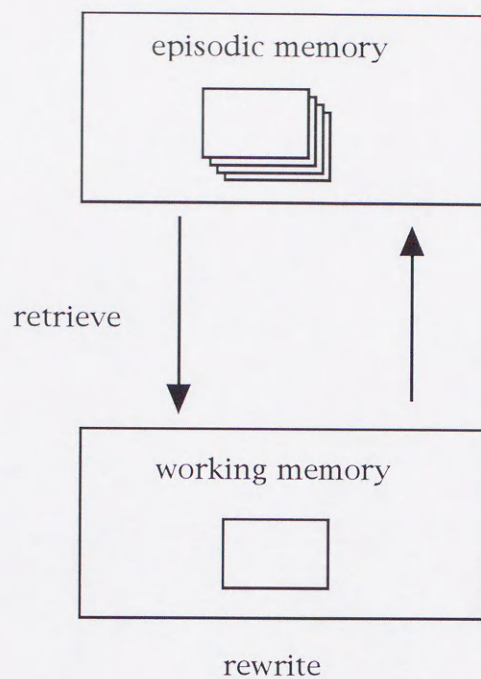


Figure 2 Updating of file cards

To sum up, the episodic memory is (i) a level where the information processed in the working memory is stored as a file card, (ii) a level where the content of stored file cards is proved to be certain, and (iii) an "intermediate" level between the working memory and the permanent semantic or episodic memory.

2.2.3 Permanent Semantic Memory

The permanent semantic memory contains the information about conceptual and procedural meaning of lexical items; that is, it is just the same as the "lexicon", which linguists have been called. The permanent semantic memory is a "deeper" level than the working memory and the episodic memory. Thus, to access the permanent semantic memory costs more than to access the working memory of the episodic memory. In conversation or written text, we try to use the anaphoric expressions which refer to the

entities in the working or episodic memory instead of the lexical items which contains lexical content, in order to avoid accessing the permanent semantic memory.

In the permanent semantic memory, information is stored as a collection of type representations, which are semantically (e.g., synonymy, antonymy, the whole-and-part relation, and so on) or conventionally networked/linked with each other. (i.e., the network model (see Collins and Loftus (1975))). Thus, if the interlocutor accesses to a given type representation in the permanent semantic memory, some linked type representations are activated, and get to be accessed easily. This enables us to interpret the so-called "indirect" or "inference" anaphora (see Yamanashi (1992)).

(9) きのうジーンズを買った。やっぱり、リーバイスの古い型はいい。

Kinoo *jiinzu* o katta. Yappari, *Revise* no furui kata wa ii.

'I bought a pair of jeans. The old type made by *Revise* is good.'

When the hearer hear the word *jiinzu* 'jeans', (s)he accesses the type representation which contains the information of *jiinzu* in the permanent semantic memory. The type representation of jeans contains various information and is linked to other type representations. For the hearer to interpret the utterance in (9) as coherent, (s)he need to access the type representation which contains the information that *Revise* is one of the maker of jeans, which is linked to the type representation of jeans. The link among type representations is not a one-to-one relation; that is, a type representation is linked to some type representations, and vice versa. Furthermore, most of the links among type representations are conventional; that is, it is depend on the speaker's knowledge of the world, or determined by abduction.

To sum up, the permanent semantic memory is (i) a level where conceptual and procedural meaning of lexical items are stored as type representations, (ii) a level where the type representations are networked/linked with each other, and (iii) the deepest level of human's memory storages.

2.3 File Management Instructions

In the model presented here, human's information processing is a metaphor of file management instructions. In this section, we introduce the notion of "folder", which is a labeled container of file cards in the working memory.

The folder plays an important role in maintaining coherence or shifting a topic in conversation and texts.

2.3.1 Forming and Labeling a Folder

In conversation and written texts, the speaker/writer tends to talk about one thing, which is called "topic" or "theme" in linguistic literature. However, at the beginning of conversation or text, the hearer/reader, in general, does not know what the speaker/writer will talk about. Thus, at the beginning of conversation or text, the speaker/writer needs to introduce a topic that (s)he want to talk about to the hearer/reader. In the model of file management, introducing a topic is taken as a formation of a new "folder" in the working memory. The folder is labeled as a "name" of the introduced topic. The following information which is entered into the working memory is temporarily saved in the folder formed in the working memory. As long as a topic is shifted or a new topic is introduced, the folder is maintained. The flow of information is schematically represented as Figure 3 below.

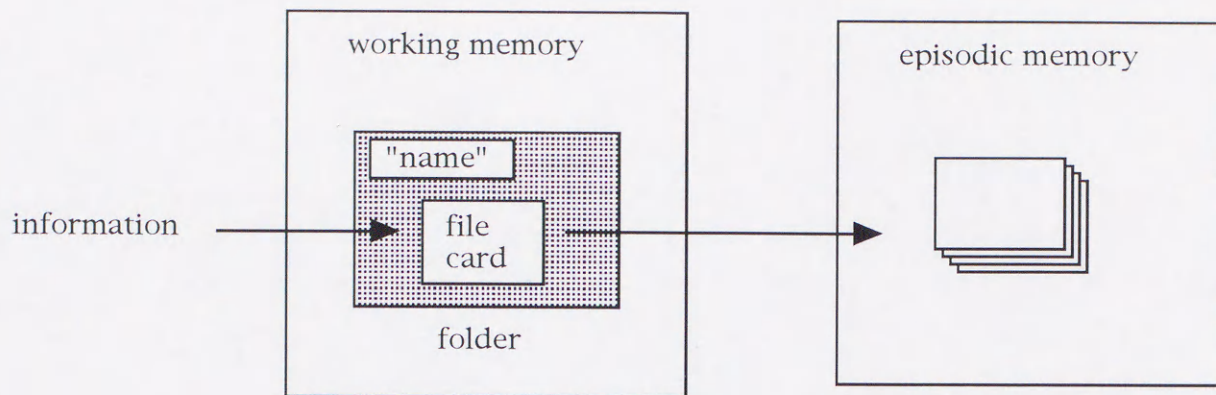


Figure 3 Flow of information

In what follows, we will see how the speaker/writer forms a folder in the working memory.

First, let us see the case of conversation. At the beginning of conversation, the speaker hardly introduces a "brand-new" topic without special reasons. In general, the speaker tries to introduce the topic which is based on the "mutual knowledge" of the speaker and the hearer. However, the speaker cannot access directly to the hearer's memory system. In other words, the speaker has no direct means of what the hearer knows and does not know.

Thus, the speaker needs to access his/her own memory system, and calculate the mutual knowledge of the speaker and the hearer (see Clark and Marshall (1981)). In conversation, the speaker and the hearer share the context where they are talking. This means that it is easy for the speaker to assume that the entities in the context are taken as the mutual knowledge. We assume that in the beginning of conversation, the folder of "here-and-now" is formed by default in the working memory. The folder of "here-and-now" contains all the entities that exists in the context: e.g., the speaker, the hearer, and so on. The speaker picks an entity in the folder of "here-and-

now", and tries to relate it to the topic that (s)he want to introduce the hearer. Observe the following invented examples, which are the beginnings of conversation.

(10) a. オレの友だちで、稲垣っていうヤツがいるんだけど...

Ore no tomodachi de *Inagaki* tteiu yatsu ga iru nda kedo...

'Inagaki, who is a friend of mine, ...'

b. ほら、稲垣ってさ、高校の時となりのクラスにちょー背高いヤツいた

じゃん、...

Hora, *Inagaki* tte sa, kookoo no toki tonari no kurasu ni cho se takai yatsu ita jan, ...

'You know Inagaki, who is a very tall boy when we are high school students, and belongs to our next-door class, ...'

c. ?稲垣ってヤツがさあ、...

?*Inagaki* tte iu yatsu ga saa, ...

'Inagaki is ...'

In (10), the speaker want to talk about the person *Inagaki*. In (10a), the speaker introduces *Inagaki* as a friend of himself (i.e. *ore no tomodachi* 'a friend of mine'). In (10b), the speaker introduces *Inagaki* as a very tall boy in the interlocutors' next-door class in high school (i.e., *kookoo no toki tonari no kurasu ni ita cho se takai yatsu*). In (10a), the speaker himself is an "anchor" of introducing a new entity, while in (10b), the hearer is an anchor and the speaker accesses the hearer's file card in his episodic memory and relates a part of its content to a new entity. Note that (10c) is unnatural as the beginning of conversation. In (10c), the speaker introduce *Inagaki* without anchor. If the hearer is told (10c) "out of the blue", (s)he has to form a new folder with no links in the working memory or episodic memory.

It takes the hearer much cost to interpretation. As long as the speaker and the hearer cooperate each other in conversation, such an introduction is avoided.

To sum up, at the beginning of conversation, the interlocutors tend to avoid to form a brand-new folder in the working memory. The speaker uses entities in the context (the "here-and-now" folder) as an anchor, and form a folder related to it. We assume here that at the beginning of conversation, the "here-and-now" folder is formed as a "default" active folder in the interlocutors' working memory. The state of memory storages at the beginning of conversation is schematically represented in Figure 4.

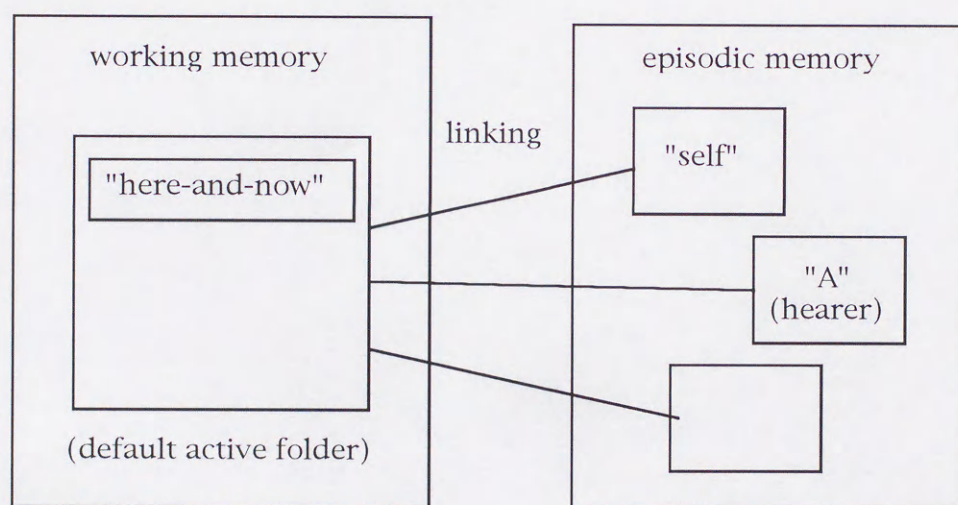


Figure 4 State of the memory at the beginning of conversation

Next let us see the case of the nonfiction text. The writer and the reader do not share the same context. However, in the nonfiction text, the writer and the reader live in the same "real world"; thus, they share the mutual knowledge of the real world. As seen in the case of conversation, if forming a brand-new folder is avoided (as long as there is no special reason), the writer picks an entity in the file cards of "real world", and tries to relate it to

the topic that (s)he want to introduce the reader. In fact, at the beginning of the nonfiction text, the writer often refers to the recent state of affairs in the real world. The following examples are the beginning of the essays on current events in a certain news paper.

(11) a. 第二次世界大戦が終わって、ちょうど半世紀である。

Diniji-sekai-taisen ga owat te, choodo han-seiki de aru.

'It is half a century since the Second World War ended.'

b. 中国が四十二回目の核実験をした。

Chuugoku ga 42 kai me no kaku jikken o shita.

'China have done 42th nuclear test.'

c. マインド・コントロールということばを最近よく聞く。

Maindo-kontorooru toiu kotoba o saikin yoku kiku.

'Recently we have often heard the term of the mind control.'

(*Tenseijingo*, 1995.5)

In the nonfiction text, the writer himself/herself is one of the entities in the real world where the writer and the reader live. At the beginning of essays, the writer often makes use of himself/herself an anchor of the topic (s)he want to talk about.

(12) a. 私がはじめて俳句を日本語で詠んだのは、大学院のときだった。

Watashi ga hajimete haiku o nihongo de yonda no wa,

daigakuin no toki datta.

'I made a haiku with Japanese language at first, when I was a

graduate student.'

(*Hanatsubaki to akai neko-guruma*, Mark Petersen)

b. 祖父が死んだのは私が高二のときである。

Sofu ga shinda no wa watashi ga kooni no toki de aru.

'When I was a second grade of a high school, my grandfather died.'

(*Momo no kanzume*, Momoko Sakura)

c. あまり知られていないが、実は僕は二卵性双生児の一人としてこの世に生を受けた。

Amari shirarete inai ga, jitsu wa boku wa niransei-sooseiji no hitori tosite kono yo ni sei o uketa.

'It is not well-known that I was born as one of the twins.'

("Me" Sadaharu Oh)

Note that in the case of nonfiction text, not just as in the case of conversation, the writer does not often use the reader as an anchor. In written text, the writer, in general, assumes that the reader is not a specific one but a generic or arbitrary one. This means that the writer accesses not a specific reader's file card in the episodic memory but a generic or arbitrary readers' type representation in the permanent semantic memory. The generic or arbitrary readers' type representation contains no specific information. Thus, the writer cannot use it as an anchor of introducing a specific topic. When the writer uses the generic and arbitrary readers' type representation as an anchor, (s)he often chooses the style of the question of whether the generic and arbitrary readers know the topic that the writer wants to introduce.

(13) カーネル・サンダースの人形というのをご存じでしょうか。

Kaeneru Sandaasu no ningyoo to iu no o gozonji daroo ka.

'Do you know the stature of Kernel Sanders?'

(*Kaeneru Sandaasu to Ninomiya Kinjiro*, Shoichi Inoie)

At the beginning of the nonfiction text, however, the writer sometimes introduces a brand-new topic without anchors.

(14) a. 冷蔵庫のフリーザー（冷凍庫）には、実にさまざまな食品が詰まっているものだ。

Reizooko no furiizaa (reitooko) ni wa, jitsu ni samazama na shokuhin ga tsumatte iru mono da.

'There are various kinds of food in the freezer compartment of a refrigerator.'

(*Haha no kiku*, Ryuichiro Utsumi)

b. 水虫と言えたいがいおっさんの持病であり、...

Mizumushi to ieba taigai ossan no jibyō de ari, ...

'As for the athlete, the older men is often suffering from it, ...'

(*Momo no kanzume*, Momoko Sakura)

In these cases, the writer does not use the mutual knowledge of the recent affairs of the real world, but rather chooses to form a brand-new folder in the reader's working memory. This is a "dangerous" choice to cost the reader (see the case of (10c) in conversation). However, in the written text, as long as the reader is generic or arbitrary, it is also dangerous to access the writer's own episodic memory and calculate the mutual knowledge. In the cases of (14), the writer chooses the "danger" to get the reader to form a brand-new folder, instead of choosing the "danger" to calculate the mutual knowledge from unreliable (nonspecific) information.

Finally let us see the case of the fiction text. The world in the fiction text is different from the the real world where the reader lives. Thus, the writer cannot use as an anchor the mutual knowledge of the real world. As in the last case of the nonfiction text (see (14)), the writer must introduce a brand-new topic without anchors. In fact, in the following examples, the writer introduces a brand-new topic out of the blue.

(15) a. ハットーは、ポケットにボトルとナットをつっこんだまま、薄暗い部屋に実体化した。

Hatto wa, poketto ni boruto to natto o tsukkonda mama, usugurai heya ni jittaika shita.

'Hatto appears in the poorly lighted room with the bolt and nut in his pocket.'

(Dooke no kugi, Jin Kusano)

b. いつもの洞窟の入り口に、オージはいた。

Itsumo no dookutsu no iriguchi ni, Ooji wa ita.

'Ooji is in front of the cave as usual.'

(Senzo-gaeri, Kazuhito Morishita)

In fiction text, the writer sometimes creates a "new world" at the beginning of the text.

(16) 金属に似た冴えをもつ青空に、一本の橋が懸かっている。細い、銀色の橋だ。大きく弧を描いてせり上がり、虚空の奥で頂点に達したその先は一見えない。

Kinzoku ni nita sae o motsu aozora ni, ippon no hashi ga kakatte iru. Hosoi, gin-iro no ookina hashi da. Ookiku ko o egaite seriagari, kokuu no oku de choten ni tasshita sono saki wa mienai.

'There is a bridge in the metallic blue sky. It is a narrow, silver, and big one. We cannot see the end of the bridge, which describes an arc in the empty air.'

(Sookyuu no te, Taku Mayumura)

Creating the new world is just alike drawing a picture. When we draw a picture, we can begin to draw from either a figure or its background. In the case of (15), the writer draws a figure before drawing background, while in the case of (16), the writer draws background before drawing a figure.

In this section, we have seen how the speaker/writer forms a folder in the

working memory in three cases: conversation, nonfiction text, and fiction text. In all of the cases, the speaker/writer tries to form a folder with an anchor linked to the mutual knowledge of the speaker/writer and the hearer/reader, and to avoid forming a brand-new folder without anchors as long as there is no special reason to choose another strategy.

2.3.2 Keeping an Folder Active

The folder formed in the working memory is kept active, as long as a new folder is formed. In this section, we will see how a folder is maintained in conversation or text.

Before discuss it, we assume that in the working memory, only one folder is active at any given time, although some folders are stacked up in the working memory. In other words, we cannot keep more than two folders active at the same time. This constraint is followed from cognitive reason (we will discuss this point in the next section).

Keeping a folder active is a default process. As long as there is no special cue to form a new folder, the folder formed at a time is kept active. In conversation or written text, the active folder is kept by the lowest cost of anaphoric devices.

(17) A: まあ、どうしたの？

Maa, doo shita no?

'Oh, What did you do?'

B: どうしたもこうしたもないよ。オーブントースターをあやふやに置くからだ。

Doo shita mo koo shita mo nai yo. *Oobun toosutaa* o ayahuya ni oku kara da.

'What did you say? You put the toaster unstably on the refrigerator!'

A: 私はきちんといつものように冷蔵庫のうえに ø 置いたわよ。おかしいわね。冷蔵庫でも振動して、それで ø 落ちたのかしら。

Watashi wa kichin to itumo no yooni reizooko no ue ni ø oita wa yo. Okashii wa ne. Reizooko de mo shindoo shite sorede ø ochita no kashira.

'I put it on the refrigerator stably as usual! It is strange. I think the vibration of the refrigerator made it fall.'

(*Wata no kuni hoshi*, Yumiko Oshima)

(18) 話は少々それるが、ヒロシは近所の火事などは必ず見に行く。ø 少し遠い場所の火事は屋根に登って見る。ø 田子の浦にヘドロがたまって問題になったころには私を連れて車でヘドロを見に行ったし、ø デパートにバルタン星人の人形が来たときも見に行った。

Hanashi wa shosho soreru ga, *Hiroshi* wa kinjo no kaji nado wa kanarazu mi ni iku. ø sukoshi tooi basho no kaji wa yane ni nobotte miru. ø Tagonoura ni hedoro ga tamatte mondai ni natta koro ni wa watashi o tsurete kuruma de hedoro o mi ni itta shi, ø depaato ni Barutan-seijin no ningyo ga kita toki mo mi ni itta.

'Getting off the subject, Hiroshi always go to see a fire in his neighborhood. He climbs up onto the roof to see a fire which breaks out at a distance. When there was a lot of polluted sediment in Tagonoura, he took me to see it by car, and when the doll of Barutan-Alien came to the rooftop of a department store, he went to see it.'

(*Ano koro*, Momoko Sakura)

In Japanese, the zero pronoun is used to keep a folder active. In other words, the zero pronoun refers to the "name" of the active folder at a given time (we will discuss other types of referring expressions in Chapter 4).

Keeping a folder active spends processing resources. As time goes, the active folder is gradually declining. Thus, the speaker/writer sometimes needs to reactivate the declining folder.

(18) 幼い少女はまだ尋ねることがあるのか、というようにわずかに首をかしげた。

... (中略) ...

少女は、それ以上、リトルバラの質問に応じている時間的余裕をもたないもの
のようだった。

*Osanai shojo wa mada tazuneru koto ga aru no ka, to iu yooni
wazuka ni kubi o kashigeta.*

... (some sentences) ...

*Shojo wa, sore ijoo, Ritorubara no shitsumon ni oojite iru jikan-teki
yoyuu o motanai mono no yoo datta.*

'A little girl leaned her head a little, while she thought whether
there were more questions. ... The girl seemed to have no time to
answer Ritoribara's questions.'

(*Nichibotsu-mae ni hasshin seyo*, Ryu Mitsuse)

In Japanese, the particle *wa* functions as a marker of reactivating the declining folder (we will discuss the function of *wa* in Chapter 3).

2.3.3 Renewing and Reactivating a Folder

As discussed in section 2.3.2, keeping a folder active is a default process. To

form a new folder in the working memory, we use some special linguistic devices. If a new folder is formed, an older folder is deactivated because of the one-folder-at-a-time constraint. Note that the deactivated folders are not erased from the working memory, but they remain deactivated and stacked in the working memory. Thus, they can be reactivated by some linguistic devices. In this section, we will see how a new folder is formed and a deactivated folder is reactivated in conversation and text.

On the way to continue conversation or text, forming a new folder involves deactivating an older folder. Forming a new folder and deactivating an former folder corresponds with the shift of topic in conversation or text. As seen in section 2.3.1, keeping a folder active is a default process. Thus, to form a new folder, we need to use some special [marked] linguistic devices. Observe the following example, cited from Kuno (1983, 124).

(19) A: 君はこの本を読みましたか。

Kimi wa kono hon o yomi mashi ta ka?

'Have you read this book?'

B: (a) 読みませんでした。

Yomi masendeshi ta.

'No, I haven't.'

(b) その本は読みませんでした。

Sono hon wa yomi masendeshi ta.

'No, I haven't read this book.'

When the speaker A says the question of (19), the folder named as B is formed in the interlocutors' working memories. Next, the answer of B(a) is entered on the file card in the folder named as B, in which B and *kono hon* 'this book' are represented as the lowest cost of [unmarked] devices (i.e., zero

pronouns). However, the answer of B(b) forms a new folder named as *sono hon* 'the book'. In this case, the particle *wa* is used to signal to form a new folder. The answer of B(b) is about the book, not about B. This process is schematically represented in Figure 5 below.

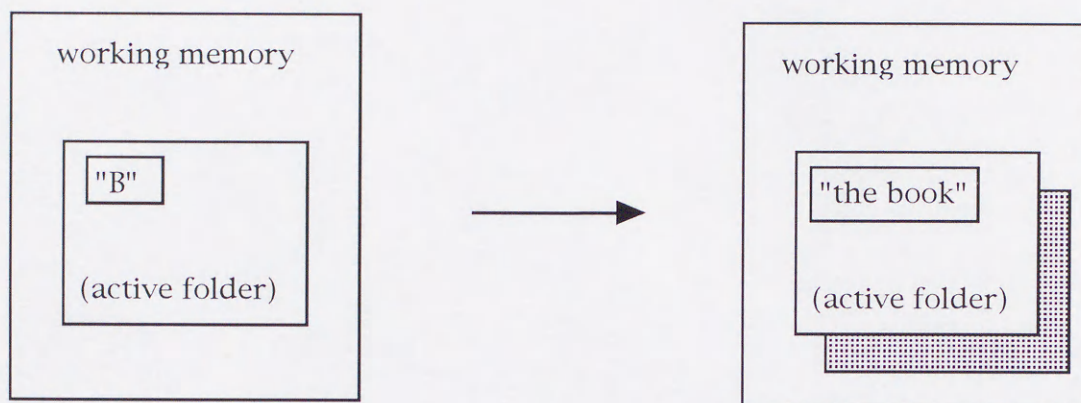


Figure 5 Formation of a new folder

Next, let us see the case of reactivating a deactivated folder in the working memory. The deactivated folder represents the topic that has been mentioned in the preceding discourse. Thus, reactivating a deactivated folder corresponds with the revival of a former topic.

(20) 畠山重篤さんは、宮城県の気仙沼湾で牡蛎の養殖をしている。

... (中略) ...

それを題名にした本を畠山さんは書き、各地の小学生に講演したり、養殖場で体験授業をさせたりしている。

Hatakeyama Shigeatsu san wa, Miyagi-ken no Kesenuma-wan de kaki o yooshoku shi te iru.

... (some sentences) ...

Sore o daimei ni shita hon o Hatakeyama san wa kaki, kakuchi no shogakkusei ni kooen shi tari, yoshokujo de taiken-jugyo o sase tari

shite iru.

'Mr. Shigeatsu Hatakeyama is engaged in oyster forming in the bay of Kesenuma. Mr. Hatakeyama wrote a book whose title is taken from it, gives a lecture at local elementary schools, and lets them have an experience at his farm.'

(*Tenseijingo*, 1995.5)

(21) 彩子と知り合ったきっかけは、門司での撮影だった。

... (中略) ...

そういったアングルで二つの都市をクローズ・アップするのが番組の目的だったが、その番組のレポーター役としてやってきたのが彩子だった。

Ayako to shiriatta kikkake wa, Moji de no satsuei datta.

... (some sentences) ...

Sooitta anguru de hutatsu no toshi o kuroozu appu suru no ga bangumi no mokuteki datta ga, sono bangumi no repootaa yaku toshite yatte kita no ga Ayako datta.

'It was on the location in Moji that I met Ayako. The aim of the TV program is to focus the two cities from such an angle. It was Ayako who came as a reporter of the TV program.

(*Yume no irodori*, Tomomi Muramatsu)

In (20), the *wa*-marked phrase functions as a cue to reactivate a deactivated folder. In (21), the so-called "pseudo-cleft" sentence is used to signal reactivating a deactivated folder.

Note that both when a new folder is formed and when a deactivated folder is reactivated, we tend to use an anchor, just as seen in the case of forming a new folder at the opening of conversation or text (see section 2.3.1). The (preposed) *o*-marked phrase in (20) and *ga*-marked phrase in the pseudo-

cleft function as an anchor linked to content of the file card in the working memory. Some of the "connective" items has the same function as an anchor. In fact, the following connective items are often used, especially, in written text.

- (22) そして、それで、そこで、それゆえ、そうして
soshite, sorede, sokode, soreyue, sooshite
'and then'

If these anchors are not used, the topic-shifting marker is used.

- (23) ところで、さて、閑話休題
tokorode, sate, kanwa-kyudai
'by the way'

To sum up, to form a new folder or reactivate a deactivated folder in the working memory, we need to use some special linguistic devices, because keeping a folder active is a default process.

2.3.4 Forming a Folder in a Folder

As seen in section 2.3.1, we assume that only one folder is active in the working memory at a given time (the one-folder-at-a-time constraint). This constraint does not prohibit us from forming a folder in a folder. In other words, embedded folders are allowed. Typically, the uppermost folder represents a point-of-view person, and the embedded folder represents a topic viewed from the point-of-view person. At the beginning of conversation, the uppermost folder is named as the speaker by default. This is supported by the fact that in conversation, the so-called psych-predicates (*omoshiroi* 'interesting', *ureshii* 'glad', *tanoshii* 'enjoy', *kanashii* 'sad', and so on) represent the speaker's mental state without an overt experiencer. In

nonfiction text, the uppermost folder is named as the writer. In the fiction text, the uppermost folder is named as the central character; i.e., a hero or heroine. The typical case of the folder which contains an embedded folder is schematically represented as in Figure 6 below.

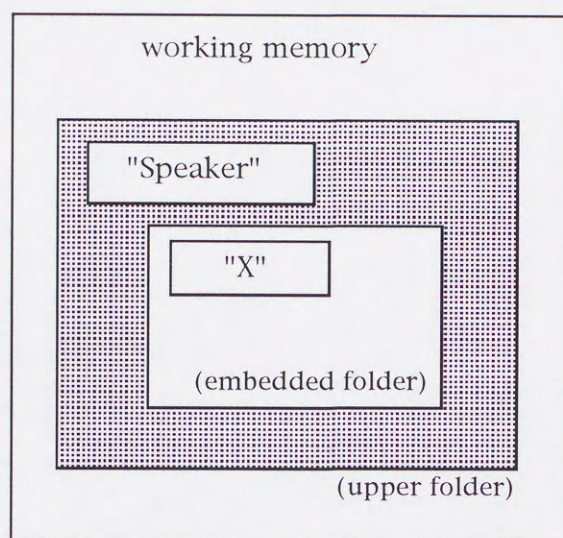


Figure 6 Forming a folder in a folder

The uppermost folder is being deactivated while the embedded folder is active. In the end of nonfiction text, especially essays, the writer often reactivates the uppermost folder.

(24) 子どものうちはやっぱり、「胸」、「背中」に甘えちゃいけないと、私は思ったのだった。

Kodomo no uchi wa yappari, "mune", "senaka" ni amaecha ikenai to *watashi wa omotta no datta.* (the end of the text)

'I think that you must not depend on "breast" or "back" when you are children.'

(*Mune no atakasa to manazashi*, Noriko Okifuji)

In (21), the phrase of *watashi wa* reactivates the uppermost folder named as

the writer. This reminds the reader that the topic is viewed from the writer, which has not been mentioned for a while.

2.3.5 Entering Information on a File Card

The information coming in the working memory is entered on a file card. The information is divided into some clusters of information: the subject, the object, and so on. How to divide information into some clusters depends on the cognitive properties of entities. The most salient entity is selected as the subject. The saliency is a collection of the cognitive properties.

- (25) a. human > nonhuman
- b. animate > inanimate
- c. movable > stable
- d. concrete > abstract
- e. conscious > unconscious

If the subject is selected, the other grammatical relations are automatically determined in relation to the entity selected as the subject.

There is a well-known contrast of Talmy(1978).

- (26) a. The bike is near the house.
- b. (?)The house is near the bike.

(26a) and (26b) describe the same state. However, (26b) sounds odd. In (26b), the stable entity (house) is selected as the subject, and the movable entity (bike) is background. As long as there is no special motivation, we select the most salient entity as the subject. This is the reason why (26b) sounds odd.

The most salient entity is often selected as the name of a folder. Note that how to label the name of folder depends on the speaker's assumption of

what to talk about, while how to select the entity as the most saliency depends on the collection of cognitive properties of an entity.

We assume that a file card has some slots named as grammatical relations: the subject, the object, and so on. The information coming to the working memory is divided into the slots on a file card. The divided clusters of information are arranged linearly by syntactic rules or the principles of information flow (see Chapter 5). The division of information on a file card is schematically represented in Figure 7 below.

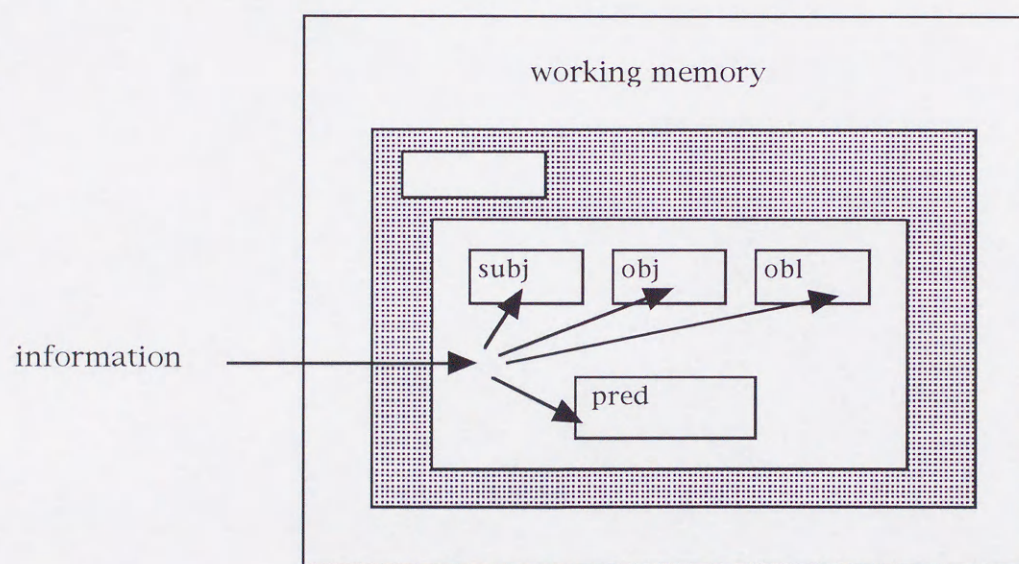


Figure 7. The division of information

2.3.6 Some General Instructions and Conditions

In this section, we have discussed how we deal with file cards in the working memory. The general instructions and conditions presented above are as follows.

(27) Folder-Forming Instruction:

In conversation or text, a folder is formed in the working memory.

(28) One-Folder-at-a-Time Constraint:

Only one folder is active in the working memory at a given time.

(29) Anchoring Convention:

The speaker/writer tries to form a folder with an anchor linked to the mutual knowledge of the speaker/writer and the hearer/reader.

(30) Keeping a folder active is a default process.

(31) We can form a folder in a folder.

(32) A file card has some slots named as the subject, the object, and so on.

(33) Slot-Linking Convention:

Link the most salient cluster of information to the subject slot on a file card.

(34) The saliency is a correction of cognitive properties of a cluster of information.

2.4 The Model of Human's Memory System and Neurology

In this chapter, we have presented the model of processing information based on the dual storage model. The model presented above is supported in neurology or neuroscience. The working memory is located in the front cortical, the (early) episodic memory is located in the sub-cortical hippocampus and medial-temporal cortical structures adjacent to it, and the permanent semantic memory is located in the front cortical. The cerebral localization is based on analyses of the aphasias; the various language disorders that arises as a consequence of focal brain damage. The case that

is damaged in the hippocampus cannot remember his/her recent experience, while (s)he can remember the experience that (s)he had have before (s)he was damaged in the brain, and keeps the knowledge of the world. On the other hand, the case that is damaged in the front cortical cannot remember the experience that (s)he has had before, while (s)he can recall the words or numbers presented just before. These cases show that information is stored in different memory storages in the brain, and that even if one memory storage is damaged, another memory storage can survive and function.

The flow of information is done by neurons in the brain. Neurons are networked with each other. A neuron is activated and conveys information to another networked neuron. In the model of information-processing presented above, file cards or type representations correspond to neurons, and the activated folder corresponds to the activated neuron.

The further research in neurology or neuroscience will shed clearer light on the memory system and the mechanism of information-processing.

Chapter Three

Information-Sensitive Particles in Japanese

3.0 Introduction

Japanese is a so-called inflectional language. In Japanese sentence, grammatical relations are represented by suffixed particles. Observe the following example.

(1) 太郎が花子に手紙をあげた。

Taro ga Hanako ni degami o ageta.

'Taro gave a letter to Hanako.'

In (1), the subject is suffixed with *ga*, the indirect object with *ni*, and the direct object with *o*. These particles function as markers of grammatical relation. However, all of the particles are not markers of a particular grammatical relation or semantic role; some of them are sensitive to information status. In the model of information-processing, some particles in Japanese are taken as information-sensitive markers to access to a particular information status in the working memory. In this chapter, we will account for the properties of these particles in the model presented in Chapter 2.

3.1 Wa

The particle *wa* has been discussed in the great deal of linguistic literature. Although the properties of *wa* is much clearer, there has so far been no uniform account to the function of *wa*. This is why every linguist is dependent on his/her framework of studies of language: i.e., the syntactic approaches, the functional approaches, the discourse grammatical approaches, the traditional studies of Japanese grammar, and so on. Each of them sheds light on the different aspect of the properties of *wa*. In this section, we try to account for a uniform account to *wa* in the model of information-processing.

3.1.1 The Properties of Wa

Every linguist depend on the different framework agrees that *wa* is not a case particle; i.e., a particle of a particular grammatical relation (the subject). This is followed from the fact that *wa* is attached to phrases with various types of grammatical relations.

- (2) a. 太郎は花子に手紙をあげた。

Taro wa Hanako ni tegami o ageta. (subject)

'Taro gave a letter to Mary.'

- b. 太郎は花子には手紙をあげた。

Taro ga Hanako ni wa tegami o ageta. (indirect object)

- c. 太郎は花子に手紙はあげた。

Taro ga Hanako ni tegami wa ageta. (direct object)

- d. 太郎は車では行かなかった。

Taro wa kuruma de wa ikanakatta. (instrumental)

'Taro did not go by car.'

- e. 太郎はここ（に）は来たことがない。

Taro wa koko (ni) wa kita koto ga nai. (location)

'Taro has not come here.'

- f. 太郎はきのうは行かなかった。

Taro wa kino wa ikanakatta. (time)

'Taro didn't go yesterday.'

- g. 太郎はゆっくりとは歩かなかった。

Taro wa yukkuri to wa arukanakatta. (manner)

'Taro didn't walk slowly'

Furthermore, *wa* is attached not only to noun phrases but also to adverbial phrases, as shown in (2f-g), and more than one of *wa* can appear in a clause, as shown in (2d-g). These facts also support that *wa* is not a case particle. In the traditional studies of Japanese grammar, *wa* is taken as a *hukujoshi* 'adverbial particle', *kakarijoshi* 'relational particle', and *toritatejoshi* 'pick-up particle'. In the classical transformational approach, *wa* is attached in the derivation, not generated in the base structure. However, there is a well-known counter-example to the approach.

- (3) a. 魚は鯛がいい。

Sakana wa tai ga oishii.

'Sea breams are the best in fish.'

- b. 花は桜がいい。

Hana wa sakura ga ii.

'Cherry blossoms are the best in flowers.'

The examples of (3) have no original "sources"; that is, the *wa*-phrases in (2) has no particular grammatical relation in the sentence.

The second property of *wa* is pointed out in the functional approaches or discourse grammatical approaches. *Wa* is attached to the phrase that represents old/given or predictable information. The following example is cited from Kuno (1973).

(4) 太郎が遊びに来た。

Taro ga asobi ni kita.

'Taro came to play.'

a. *彼がおみやげに果物をもってきてくれた。

*Kare (=Taro) ga omiyage ni kudamono o motte kite kureta.

b. 彼はおみやげに果物をもってきてくれた。

Kare (=Taro) wa omiyage ni kudamono o motte kite kureta.

'He brought fruit for a present.'

In (4), the subject of the following sentence is predictable from the preceding context. Thus, it is attached by *wa*. There is another evidence that *wa* is a particle of old information. *Wa* is not attached to the indefinite phrases.

(5) a. *だれは来たの。

*Dare wa kita no.

'Who came?'

b. *だれかは来た。

*Daraka wa kita.

'Someone came.'

Another property of *wa* is that *wa* is difficult to appear in the subordinate clauses.

(6) a. *太郎は[花子は正夫をぶったこと]を知っている。

*Taro wa [Hanako wa Masao o butta koto] o shitte iru.

'Taro knows that Hanako hit Masao.'

b. ?太郎は[花子は正夫をぶった]と言った。

?Taro wa [Hanako wa Masao o butta] to itta.

'Taro said that Hanako hit Masao.'

c. *[花子は来たので]太郎は帰った。

*[Hanako wa kita node] Taro wa kaetta.

'Taro went back because Hanako came.'

d. *[花子は来たとき]太郎は寝ていた。

*[Hanako wa kita toki] Taro wa nete ita.

'Taro was sleeping when Hanako came.'

e. [花子は来たけれど]太郎は来ない。

[Hanako wa kita keredo] Taro wa konai.

'Although Hanako came, Taro didn't come.'

As shown in (6), the difficulty of appearance of *wa* in the subordinate clause depends on the "subordinateness" of the subordinate clause to the main clause.

The observations on *wa* presented above leads us to the conclusion that *wa* is a topic marker. The fact that *wa*-phrases typically appear in the sentence-initial position corresponds to the topic-comment array in the communicative dynamism approach (see Halliday and Hasan (1976)).

However, *wa* has another property that is not attributed to a topic marker.

It is called the "contrastive" *wa*. In the examples presented in (2b-g), *wa* is interpreted not as topical but rather as contrastive. There are two types of the contrastive *wa*: the explicit contrastive, as in (7a), and the implicit contrastive, as in (7b).

(7) a. 太郎は来たが、花子は来ない。

Taro wa kita ga, Hanako wa konai.

'Taro came, but Hanako didn't come.'

b. 太郎は英語は話せない。

Taro wa eigo wa hanasenai.

'Taro cannot speak English.'

In (7a), the contrastive pair is expressed explicitly, while in (7b) it is not. (7b) implies that Taro cannot speak English, but he can speak another language. The contrastive *wa* tends to appear in the sentence-internal position (see the examples of (2b-g) and (7b)), and the non-subject phrase attached with *wa* is more likely to be interpreted as contrastive than the subject.

To sum up, the properties of *wa* presented above are as follows.

- (i) *Wa* can be attached to various types of phrases.
- (ii) More than one of *wa* can appear in a clause.
- (iii) *Wa* is attached to the phrase that represents "old" information.
- (iv) *Wa* is difficult to appear in the subordinate clauses.
- (v) The "topic" *wa*-phrase appears in the sentence-initial position.
- (vi) The non-subject phrase or sentence-internal phrase attached with *wa* tends to be interpreted as contrastive.

Most of the studies on *wa* conclude that *wa* has two different aspects: topic and contrastive.

3.1.2 *Wa* as a Folder-Activator

In this section, we will try to account for the properties of *wa* in the model of information-processing. As long as lexical items contain conceptual or/and

procedural information, *wa* has no conceptual information. *Wa* encodes only procedural information on how to access information in the working memory. We suggest that *wa* is a "folder-activator". *Wa* reactivates a decayed or deactivated folder in the working memory. Observe the following examples.

(8) 幼い少女はまだ尋ねることがあるのか、というようにわずかに首をかしげた。

... (中略) ...

少女は、それ以上、リトルバラの質問に応じている時間的余裕をもたないものようだった。

Osanai shojo wa mada tazuneru koto ga aru no ka, to iu yooni wazuka ni kubi o kashigeta.

... (some sentences) ...

Shojo wa, sore ijoo, Ritorubara no shitsumon ni oojite iru jikan-teki yoyuu o motanai mono no yoo datta.

'A little girl leaned her head a little, while she thought whether there were more questions. ... The girl seemed to have no time to answer Ritoribara's questions.'

(*Nichibotsu-mae ni hasshin seyo*, Ryu Mitsuse)

(9) 畠山重篤さんは、宮城県の気仙沼湾で牡蛎の養殖をしている。

... (中略) ...

それを題名にした本を畠山さんは書き、各地の小学生に講演したり、養殖場で体験授業をさせたりしている。

Hatakeyama Shigeatsu san wa, Miyagi-ken no Kesenuma-wan de kaki o yooshoku shi te iru.

... (some sentences) ...

Sore o daimei ni shita hon o Hatakeyama san wa kaki, kakuchi no shogakkusei ni kooen shi tari, yoshokujo de taiken-jugyo o sase tari shite iru.

'Mr. Shigeatsu Hatakeyama is engaged in oyster forming in the bay of Kesenuma. Mr. Hatakeyama wrote a book whose title is taken from it, gives a lecture at local elementary schools, and lets them have an experience at his farm.'

(*Tenseijingo*, 1995.5)

(10) 子どものうちはやっぱり、「胸」、「背中」に甘えちゃいけないと、私は思ったのだった。

Kodomo no uchi wa yappari, "mune", "senaka" ni amaecha ikenai to watashi wa omotta no datta. (the end of the text)

'I think that you must not depend on "breast" or "back" when you are children.'

(*Mune no atatakasa to manazashi*, Noriko Okifuji)

In (8), the decayed folder named as *osanai shojo* 'little girl' is reactivated by the particle *wa*. In (9), the deactivated folder named as *Hatakeyama Shigeatsu* is reactivated by the particle *wa*. In (10), the upper most (decayed or deactivated) folder named as the writer is reactivated by the particle *wa*. The function of *wa* is schematically represented in Figure 1 below.

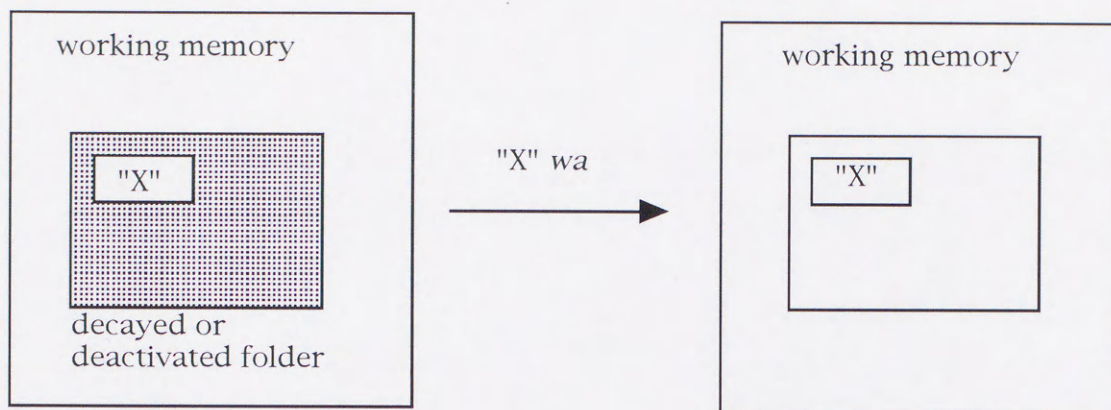


Figure 1. Reactivating a decayed or deactivated folder by *wa*

The examples presented above are in the middle or end of discourse. However, *wa* appears only in such places. *Wa* can appear in the beginning of conversation or text. First let us see the case of the beginning of conversation.

(11) 「なあ、加奈は真珠のネックレスをもってるかよ」

ふいに彼は尋ねたのだ。

"Naa, Kana *wa* shinju no nekkuresu o motteru kayo."

Fui ni kare *wa* tazuneta no da.

"Well, do you have a pearl necklace?"

Suddenly, he asked me.'

(*Shinju no wake*, Mariko Hayashi)

(12) 「これはなんだろう」

とラグが言ったとたん、何か堅いものがキムの肩にぶつかり、彼は甲高い悲鳴をあげた。

"Kore *wa*, nan daroo"

to Ragu ga itta totan, nanika katai mono ga Kimu no kata ni butsukari, kare *wa* kandakai himei o ageta.

"What is this?"

As soon as Rag said so, Kim was hit by something hard and cried with high-pitched voice.'

(*Shicho, odenwa desu*, Jin Kusano)

(13) あの時最初に声を掛けてきたのは倉沢だった。

「それは加賀小紋ですね」

Ano toki saisho ni koe o kakete kita no wa Kurasawa datta.

"Sore wa Kagakomon desune."

At that time, it is Kurasawa who asked me first.

"Is it Kagakomon?"

(*Yukionna*, Kei Yuikawa)

At the beginning of conversation, the folder named as "here-and-now" is active by default. The "here-nad-now" folder contains the various types of information as to what exists in the context: i.e., the speaker, the hearer, and the things that exist in the context. They are deactivated in the folder. Thus, they are able to be reactivated by the particle *wa*. In (11), *Kana* refers to the hearer, and in (12) and (13), *kore* 'this' and *sore* 'that' refer to the things that exist in the context. In these examples, *wa* picks up the thing or person that exists in the context, and makes its name's folder formed in the speaker and hearer's working memories.

Next let us see the case of beginning of nonfiction text.

(14) あまり知られていないが、実は僕は二卵性双生児の一人としてこの世に生を受けた。

Amari shirarete inai ga, jitsu wa boku wa niransei-sooseiji no hitori tosite kono yo ni sei o uketa.

'It is not well-known that I was born as one of the twins.'

("Me" Sadaharu Oh)

(15) この夏の猛暑は長かった。

Kono natsu no moosho wa nagakatta.

'It was very hot in this summer for a long time.'

(*Aki tatsu yama, Yoshiko Shibaki*)

(16) 今週の半ば、ミッテラン氏はフランスの大統領職をシラク氏に引き継ぐ。

Konshu nakaba, Mitteran shi wa Furansu no Daitooryoo-syoku o
Shiraku shi ni hikitsugu.

'Mr. Mitteran will hand the President of France over to Mr. Shiraku.'

(*Asahi Shinbun, Tenseijingo, 1995.5.15*)

In the nonfiction text, the writer and the reader share the real world they live. We assume that at the beginning of fiction text, the folder named as "real world" is active by default in the working memory. The "real world" folder is linked to the file cards on which recent state of affairs is entered in the episodic memory. In the examples of (14), (15) and (16), such information is reactivated by the particle *wa*.

Finally let us see the case of beginning of fiction text.

(17) ハットーは、ポケットにボトルとナットをつっこんだまま、薄暗い部屋に実体化した。

*Hatto wa, poketto ni boruto to natto o tsukkonda mama, usugurai
heya ni jittaika shita.*

'Hatto appears in the poorly lighted room with the bolt and nut in his pocket.'

(*Dooke no kugi, Jin Kusano*)

(18) そのラーメン屋はひどく混んでいた。

Sono Raamen-ya wa hidoku konde ita.

'That Ramen shop was very crowded.'

(*Doraibu to ai no tetsugaku ni kansuru
jakkan no koosatsu*, Kenichi Yamakawa)

In nonfiction text, the writer and the reader do not share the knowledge of the same world. The world in fiction text is different from the the real world where the reader lives. Thus, at the beginning of fiction text, the writer need to introduce the reader(s) a new world. We assume that at the beginning of fiction text, the "unspecified folder" is formed in the working memory by default. The unspecified folder is the folder whose name is unspecified. The *wa*-phrase that appears at the beginning of the fiction text gives a name to the unspecified folder. This is a subcase of the reactivation of a decayed or deactivated folder. The decayed or deactivated folder has been named, while the unspecified folder has not been named. In the examles of (17) and (18), at the beginning of text, the name of a hero or the location a story will be developed is introduced, and its name is given to the unspecified folder in the working memory.

This option is sometimes used in fiction text. The following examples is the beginning of a nonfiction text.

(19) 冷蔵庫のフリーザーには、実にさまざまな食品が詰まっているものだ。

Reizooko no furiizaa (reitooko) ni wa, jitsu ni samazama na
shokuhin ga tsumatte iru mono da.

'There are various kinds of food in the freezer compartment of
a refrigerator.

(*Haha no kiku*, Ryuichiro Utsumi)

The process of giving a name to an unspecified folder is schematically represented in Figure 2 below.

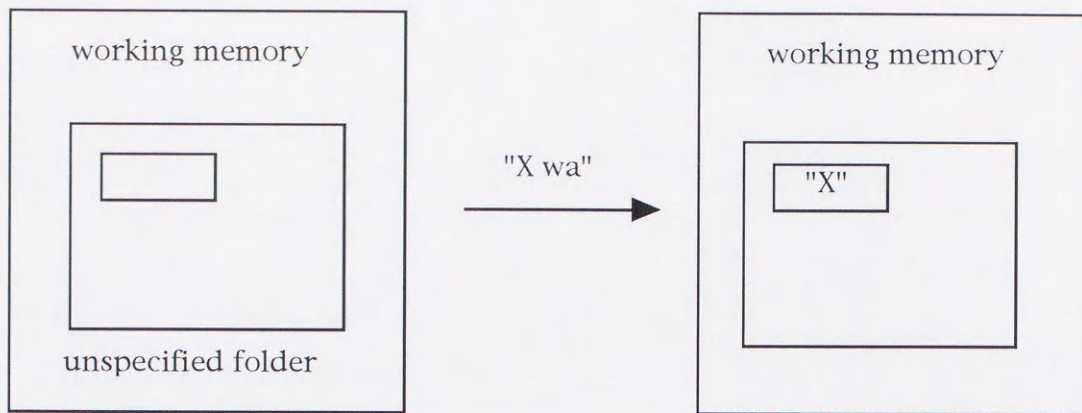


Figure 2. Giving a name to an unspecified folder

The idea of *wa* as a folder-activator accounts for some of the properties of *wa* presented in 3.1.1. The deactivated folder corresponds to the topic that has been mentioned in the preceding discourse. The decayed folder corresponds to the topic that has not been mentioned for a while. Thus, the deactivated or decayed folder represents "old" information. The information in which "here-and-now" folder contains represents "old" information, in the sense that it has been presented in the context. This is the reason why *wa* is attached to the phrase that represents "old" information.

The fact that the topic *wa*-phrase appears sentence-intially is accounted for by the effect of the one of the pragmatic arrangement principle. We will discuss the pragmatic arrangement principle in Chapter 5.

In general, the most salient entity is selected as a name of a folder. The subordinate clause represents the background information. This means that the entities represented as the elements in the subordinate clause are less salient and are not selected as a name of folder as long as there are no special motivation (e.g. contrastive). This is why *wa* is difficult to appear in the subordinate clause.

3.1.3 "Contrastive" *Wa*

In section 3.1.2, we have seen that the idea of *wa* as a folder-activator accounts for the topical property of *wa*. In this section, we will show that this idea also accounts for the "contrastive" property of *wa*, and that the "contrastive" is not the information encoded in *wa*, but the explication or implication followed from the state of working memory at a given time.

It has been pointed out that the topic *wa* and the contrastive *wa* is not a clear-cut division. This means that whether *wa* is interpreted as topic or contrastive depends on the context. In the model of information-processing, the context at a given time is represented in the working memory. The state of working memory gives rise to the contrastive interpretation. *Wa* is interpreted as contrastive, when the working memory contains the deactivated folder that competes with the folder reactivated by *wa*, or the reactivated folder is linked to the entity or entities that competes with it in the episodic or permanent semantic memory. In the former case, the contrastive pair is expressed explicitly, while in the latter case, the contrastive pair is reactivated from the experience the speaker has so far had in the episodic memory, or abducted from the knowledge of the world in the permanent semantic memory.

- (20) 「わたしは公園散歩の相手をします。社長はM宅の窓にかかる木の枝払いを
して下さい。」

Watashi wa kooen-sanpo no aite o shimasu. Shacho wa M-taku no mado ni kakaru ki no eda harai o shite kudasai.

'I will take a walk with him in the park. Let you cut off branches over the window at M's house.'

(*Mainichi ga natsuyasumi*, Yumiko Ohshima)

(21) 翌朝、まだ小雨がパラついていたが大雨はどうにか収まっていた。

Yokuasa, mada kosame ga paratsuite ita ga oomame wa doonika
osamatte ita.

'The next morning it was raining a little, but a heavy rain stopped.'

(*Ano koro*, Momoko Sakura)

(22) アメリカの高校では、大抵「世界文学」のちょっとした紹介で、俳句の英訳をいくつか教わることがある。

Amerika no kookoo de wa, taitei "Sekaibungaku" no chotto shita
shookai de, haiku no eiyaku o ikutsuka osowaru koto ga aru.

'In American high school, we used to be taught English translation
of haiku as an introduction to World Literature.'

(*Hanatsubaki to akai nekoguruma*, Mark Petersen)

(23) 夏の夕方にはこのように大雨が降ることもよくあるので、まあこの雨もそんなもんだろうと最初は軽いノリで考えていたのである。

Natsu no yuugata ni wa kono yooni ooame ga huru koto mo yoku
aru node, maa kono ame mo sonna mon daroo to saisho wa karui
nori de kangaete ita no dearu.

'It often rains heavily in the evening of summer. At first I took a
little thought this rain was the case.'

(*Ano koro*, Momoko Sakura)

The examples of (20) and (21) are the cases of the explicit contrastive. In (20), the speaker and the hearer (*shacho* 'president') are in the context. The *wa* in the second sentence reactivates the folder of the name of the hearer (*shacho*), which competes with the deactivated folder of name of the speaker

in the working memory. In (21), *ooame* 'heavey rain' competes with *kosame* 'little rain', which appears in the preceding context. On the other hand, the examples of (22) and (23) are the cases of the implicit contrastive, in which there is no explicit contrastive pair in the preceding context. In (22), American high school implies high schools of other countries (i.e. Japanese high school). This means that the file card of American high school is linked to the one of Japanese high school in the episodic memory. This link causes the contrastive interpretation. In (23), *saisho* 'first' implies *tochuu* 'intermediate' or *saigo* 'last'. The type representation of *saisho* is linked to the one of *tochuu* or *saigo* in the permanent semantic memory. These links cause the contrastive interpretation. The state of the memory system that gives rise to the contrastive interpretation is schematically represented in Figure 3 below. The figure illustrated above is the case of the explicit contrastive, while the one illustrated below is the case of the implicit contrastive.

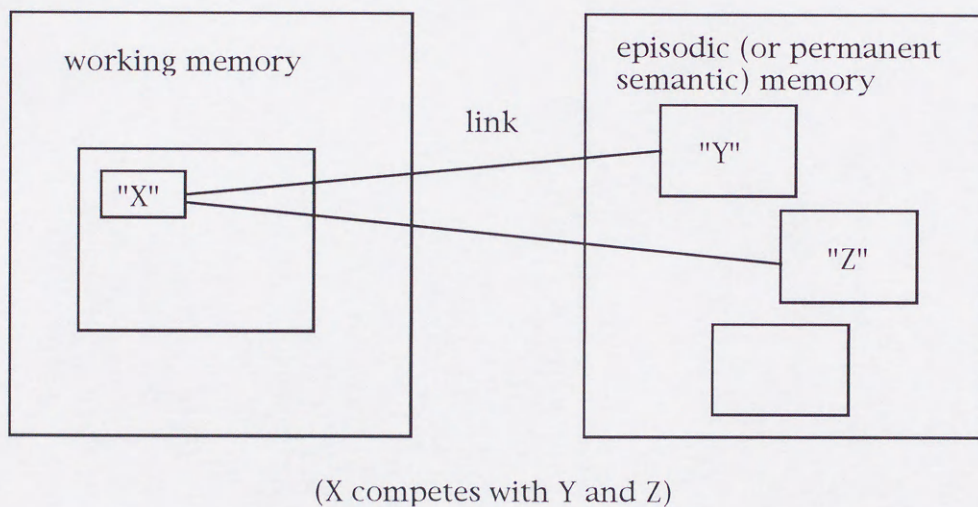
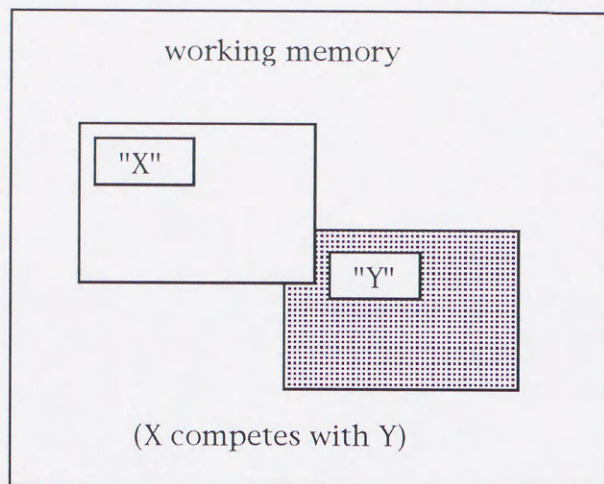


Figure 3. The context of the contrastive *wa*

The fact that the non-subject phrase attached with *wa* tends to be interpreted as contrastive is followed from its less saliency. The non-subject phrases are less salient than the subject. In general, the most salient entity is selected as a name of a folder. This means that there is a special motivation to select the less salient entity as a name of folder. One of the special motivations is to give the contrastive status to the entity.

3.2 *Ga*

In linguistic literature, the particle *ga* has been discussed in comparison with the particle *wa*. In section 3.2, we have seen that *wa* operates on the folder in the working memory. However, *ga* operates on the content of a file card. In the sense, *ga* is a "grammatical" particle.

3.2.1 The Properties of *Ga*

On the contrary to *wa*, *ga* is taken as a case particle. *Ga* is attached to the subject in a clause, although the *ga*-phrase has various semantic roles.

(24) a. 太郎が走った。

Taro *ga* hashitta. (agent)

'Taro ran.'

b. 車がこわれた。

Kuruma *ga* kowareta. (theme)

'The car was broken.'

c. 太郎が車をほしがっている。

Taro *ga* kuruma o hoshigatte iru. (experiencer)

'Taro wants a car.'

d. 日本が車が多い。

Nihon *ga* kuruma *ga* ooi. (location)

'There are a lot of car in Japan.'

Note that *ga* can be attached to another case particle, although the judgement is not stable among Japanese native speakers.

(25) a. 東京へ行くには、LAからが便利だ。

Tokyo e iku ni wa, LA kara *ga* benri da.

'It is convenient to go to Tokyo via LA.'

b. (?) 湘南へが若者がよく行く。

(?)Shonan e ga wakamono ga yoku iku.

'Young people often go to Shonan.'

c. (?) ここまでが一般客も入れます。

(?)Koko made ga ippan-kyaku mo hairemasu.

'Gests can enter here.'

As well as the case of *wa*, more than one of *ga* can appear in a clause, as shown in (24d) or (25b). The following example is cited from Kuno (1973).

(26) 文明国が男性が平均寿命が短い。

Bunmeikoku ga dansai ga heikinjumyo ga mijikai.

'The average of life span is short in civilized countries.'

In the framework of generative syntax, *ga* is a particle attached to the noun phrase which is immediately dominated by the top node of a sentence in the tree structure (see Saito (1985)). As far as we assume that the top node of a sentence is generated repeatedly, this account is valid.

In the literature of functional approaches or discourse grammar, it is pointed out that *ga* is attached to the phrase that represents new or unpredictable information. The following example is cited from Kuno (1973).

(27) A: 太郎と花子と夏子のうちで、だれが一番背が高いか。

Taro to Hanako to Natsuko no uchide, dere ga ichiban se ga takai ka.

'Who is the tallest of Taro, Hanako and Natsuko?'

B: 太郎が/*は一番背が高い。

Taro ga/*wa ichiban se ga takai.

'Taro is the tallest.'

As the answer to A, the name of the tallest person is unpredictable. Thus, it is attached by *ga*, not by *wa*.

Ga can be attached to indefinite phrases.

(28) a. だれかが来た。

Dareka *ga* kita.

'Someone came.'

b. だれが来たの。

Dare *ga* kita no.

'Who came?'

Ga can appear in the subordinate clause.

(29) a. 太郎は[花子が正夫をぶったこと]を知っている。

Taro wa [Hanako wa Masao o butta koto] o shitte iru.

'Taro knows that Hanako hit Masao.'

b. 太郎は[花子が正夫をぶった]と言った。

Taro wa [Hanako wa Masao o butta] to itta.

'Taro said that Hanako hit Masao.'

c. [花子が来たので]太郎は帰った。

[Hanako wa kita node] Taro wa kaetta.

'Taro went back because Hanako came.'

d. [花子が来たとき]太郎は寝ていた。

[Hanako wa kita toki] Taro wa nete ita.

'Taro was sleeping when Hanako came.'

e. ? [花子が来たけれど]太郎は来ない。

?[Hanako wa kita keredo] Taro wa konai.

'Although Hanako came, Taro didn't come.'

The functional [discourse-grammatical] properties of *ga* presented above is contrary to the ones of *wa*.

Kuno (1973) points out that the *ga*-phrase is interpreted as "exhaustive-listing" when its predicate represents a state or a habitual action.

(30) a. 太郎が病気だ。

Taro *ga* byooki da.

'Taro is ill.'

b. 太郎がよく質問する。

Taro *ga* yoku shitsumon suru.

'Taro often asks me a question.'

(30a) implies that (only) Taro is ill but others are not. (30b) implies that (only) Taro often asks me a question but others do not. The sentence-initial *ga*-phrase in the multiple *ga* construction is interpreted as exhaustive-listing, as shown in (24d), (25b), and (26).

The properties of *ga* presented above are as follows.

- (i) *Ga* is attached to the subject.
- (ii) More than one of *ga* can appear in a clause.
- (iii) *Ga* is attached to the phrase that represents "new" information.
- (iv) *Ga* can appear in the subordinate clause.
- (v) The *ga*-phrase is interpreted as "exhaustive-listing" when its predicate represents a state or a habitual action.
- (vi) The "exhaustive-listing" *ga*-phrase appears in the sentence-initial position.

3.2.2 *Ga* as a Saliency-Selector

In this section, we will try to account for the properties of *ga* in the model of

information-processing. I agree with the idea that *ga* is a subject marker. What is selected as the subject in a clause is not how to manage a file card, but how to enter information on a file card. As discussed in section 2.3.5, the most salient entity in the context is selected as the subject. Thus, *Ga* selects the most salient entity in the working memory, and enters it on the subject slot in a file card.

Note that selecting the most salient entity is independent on labeling a folder as an entity's name. How to select the most salient entity depends on how to recognize the world, while what is labeled a folder depends on the speaker's assumption of what is talk about. However, we tend to choose the most salient entity as what is talk about. This is why in most cases, the subject corresponds with the topic.

The exhsustive-listing interpretation of *ga* is followed from the function of *ga* as a saliency-selector. Selecting one most salient entity out of salient entities involves deselecting other salient entities. If the entities that compete with the selected entity is in the working memory, the *ga*-phrase exhibits the explicit exhaustive-listing interpretation. This is the case shown in (27), repeated here as (31).

(31) A: 太郎と花子と夏子のうちで、だれが一番背が高いか。

Taro to Hanako to Natsuko no uchide, dere ga ichiban se ga takai ka.

'Who is the tallest of Taro, Hanako and Natsuko?'

B: 太郎が/*は一番背が高い。

Taro *ga*/**wa* ichiban se ga takai.

'Taro is the tallest.'

In (31), *Hanako* and *Natsuko*, both of whom are presented in the preceding

context, are the entities that compete with *Taro*. If the selected entity is linked to the competing entities in the episodic memory, the *ga*-phrase exhibits the implicit exhaustive-listing interpretation. This is the case shown in (30), repeated here as (32).

(32) a. 太郎が病気だ。

Taro *ga* byooki da.

'Taro is ill.'

b. 太郎がよく質問する。

Taro *ga* yoku shitsumon suru.

'Taro often asks me a question.'

If in the episodic memory, the file cards of *Taro* is linked to the file cards of other people related to him (i.e., his parents, his brothers/sisters, his classmates, and so on), selecting *Taro* activates the file cards of the people related to him. The activation causes the implication of exhaustive-listing.

3.2.3 The Multiple *Ga* Construction

As shown in 3.2.1, the *ga*-phrase can iteratively appear in a clause. The multiple *ga*-phrase is allowed when the precicate represents a state or a habitual action (see the examples of (24d), (25b), and (26)). We assume that there are two types of file cards: action file cards and state file cards. The action file card consists of the subject slot, the object slot, the predicate slot, and other slots, while the state file card consists of the subject slot and the predicate slots. These two types of file cards are schematically represented in Figure 4 below.

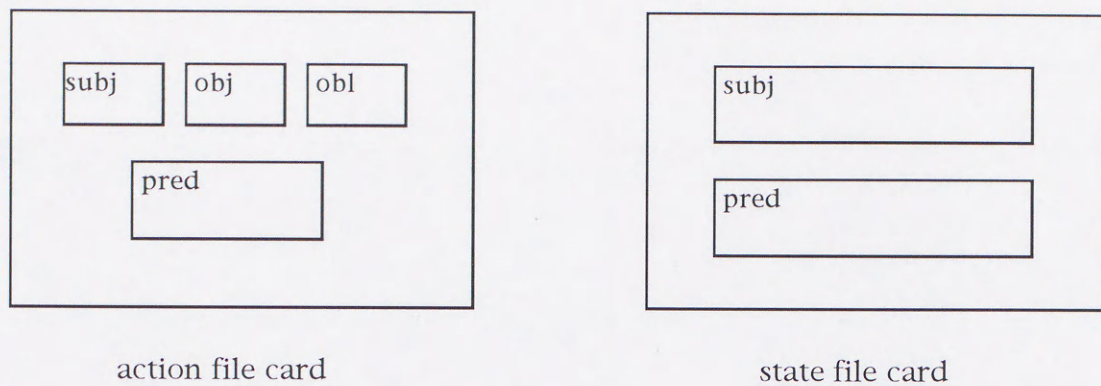


Figure 4. action file card and state file card

If the information coming in the working memory is recognized as an action, it is entered on an action file card. If the information coming in the working memory is recognized as a state, it is entered on an state file card. Note that a habitual action is taken as a sub-case of a state.

Furthermore, we assume that any file cards can be embedded into the predicate slot of the state file card. This is a convention on entering information on a file card. This process is schematically represented in Figure 5 below.

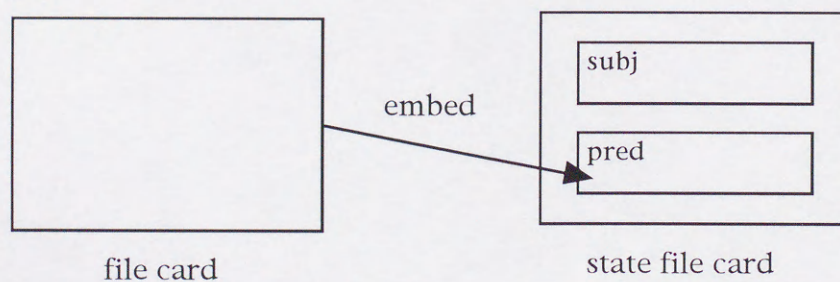


Figure 5. Embedding a file card into a state file card

It is well-known that some languages allow the multiple subject construction, while other languages do not. We assume that the file-

embedding convention is an innate one, and that in the language which does not allow the multiple subject construction, other syntactic rules prevents the multiple subject construction from occurring. On the other hand, if this convention is not innate, it must be learned from experience. This is not plausible.

3.3 *Mo*

3.3.1 The Properties of *Mo*

Mo is not a case particle. *Mo* can be attached to the phrases with various kind of grammatical relations, as well as *wa*.

- (33) a. 太郎も花子に手紙をあげた。

Taro *mo* Hanako ni tegami o ageta. (subject)

'Taro gave a letter to Mary, too.'

- b. 太郎は花子にも手紙をあげた。

Taro ga Hanako ni *mo* tegami o ageta. (indirect object)

- c. 太郎は花子に手紙もあげた。

Taro ga Hanako ni tegami *mo* ageta. (direct object)

- d. そこへは車でも行ける。

Soko e wa kuruma de *mo* ikeru. (instrumental)

'We can go there by car, too.'

- e. 太郎はここ (に) も来たことがある。

Taro wa koko (ni) *mo* kita koto ga aru. (location)

'Taro has come here, too.'

- f. 太郎はきのうも行かなかった。

Taro wa kino *mo* ikanakatta. (time)

'Taro didn't go yesterday, either.'

g. 太郎はゆっくりとも歩かなかった。

Taro wa yukkuri to *mo* arukanakatta. (manner)

'Taro didn't walk slowly'

Mo cannot be attached to the phrases with different grammatical relations in a clause. In other words, *mo* cannot appear multiply in a clause, contrary to *wa* or *ga*.

(34) *太郎も花子に手紙もあげた。

*Taro *mo* Hanako ni tagami *mo* ageta.

'Taro gave a letter to Mary, too.'

Mo causes the "parallel" interpretation. (34) implies that someone other than Taro gave a letter to Mary. In the sentences in (33), the parallel pair is expressed implicitly. In the following example, the parallel pair is expressed explicitly.

(35) 花子が来た。太郎も来た。

Hanako ga kita. Taro *mo* kita.

'Hanako came. Taro came, too.'

However, there is a case in which the parallel pair does not exist explicitly nor implicitly.

(36) もう夏休みも終わりだ。

Moo natsuyasumi *mo* owari da.

'A summer vacation will be ended soon.'

In (36), we cannot think of the parallel pair of *natsuyasumi* 'summer vacation'. This is a kind of euphemism. The existence of the parallel pair implies that a given entity is not the only one. The *mo* in (36) implies the "vacuous" parallel pair.

The phrase attached to *mo* sometimes represents the "least" entity in the context. (30a) implies that the speaker thinks that Taro is the most unlikely person to give a letter to Mary. This implication is also caused by the particle *sae*.

(37) 太郎さえ花子に手紙をあげた。

Taro *sae* Hanako ni tegami o ageta.

'Even Taro gave a letter to Hanako.'

3.3.2 *Mo* as a Copy-Maker

In this section, we will try to account for the properties of *mo* in the model of information-processing. *Mo* forms an folder in the working memory, and copies the content of the file card in the working memory except the linked entity in the file card. First, let us see the case of the explicit parallel interpretation, as in (35) , repeated here as (38).

(38) 花子が来た。太郎も来た。

Hanako ga kita. Taro *mo* kita.

'Hanako came. Taro came, too.'

In (38), the parallel pair exists as a deactivated file card in the working memory. First, *Mo* forms the folder named as *Taro*. Given that Taro is a boyfriend of Hanako, the folder named as *Taro* is linked to the deactivated folder named as *Hanako*. Next, the content of the file card named as *Hanako* is copied to a new file card in the activated folder, except the linked entity, *Hanako*. This process is schematically represented in Figure 6 below.

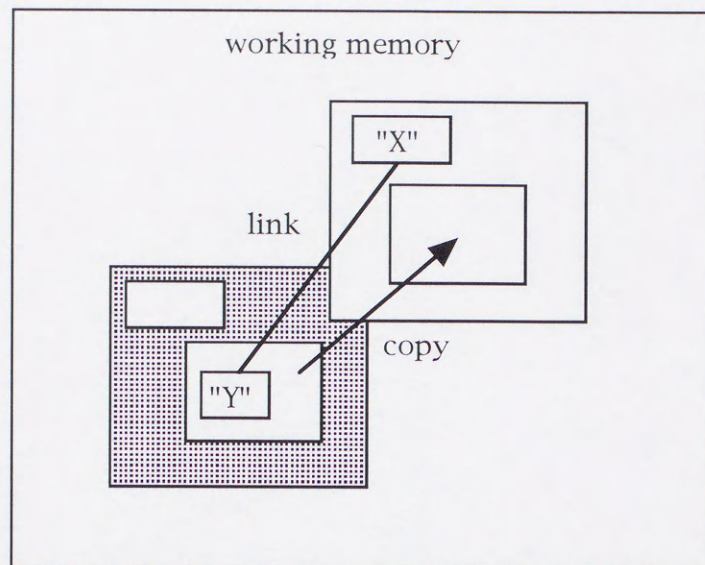


Figure 6. The function of *mo*

Next let us see the case of the implicit parallel interpretation. Repeat here (33a) as (39).

(39) 太郎も花子に手紙をあげた。

Taro *mo* Hanako ni tegami o ageta. (subject)

'Tato gave a letter to Mary, too.'

In (39), first, a file card is retrieved from the episodic memory. The file card contains the information that someone other than Taro (e.g. Jiro) gave a letter to Hanako. Next, the folder labeled as Taro, who is linked to someone (e.g. Jiro) in the retrieved file card, is formed, and then the content of the retrieved file card except the linked entity (e.g. Jiro) is copied to a new file card in the activated folder. This process is schematically represented in Figure 7 below.

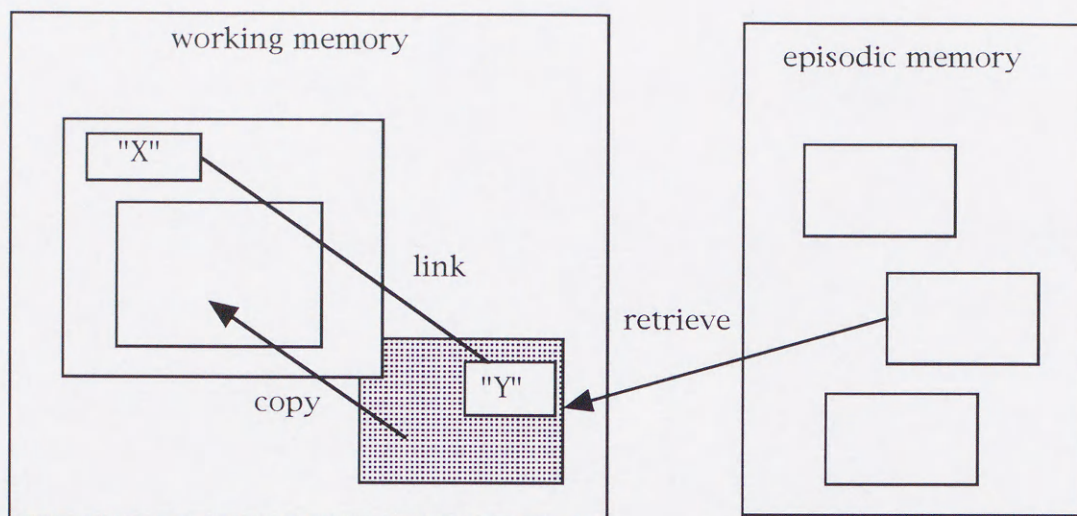


Figure 7. The implicit *mo*

Finally let us see the case of the "vacuous" parallel interpretation. Repeat here (36) as (40).

(40) もう夏休みも終わりだ。

Moo natsuyasumi *mo* owari da.

'A summer vacation will be ended soon.'

In (40), first, the folder labeled as *natsuyasumi* 'summer vacation' is formed in the working memory, and the information is entered on a file card. Next, a "vacuous" file card, which has no information content, is created in the working memory, and then the content of the file card except the linked entity in the folder is copied to the vacuous file card. We assume that the vacuous file card has no informational value and plays a role to implicate the existence of the parallel pair. This process is schematically represented in Figure 8 below.

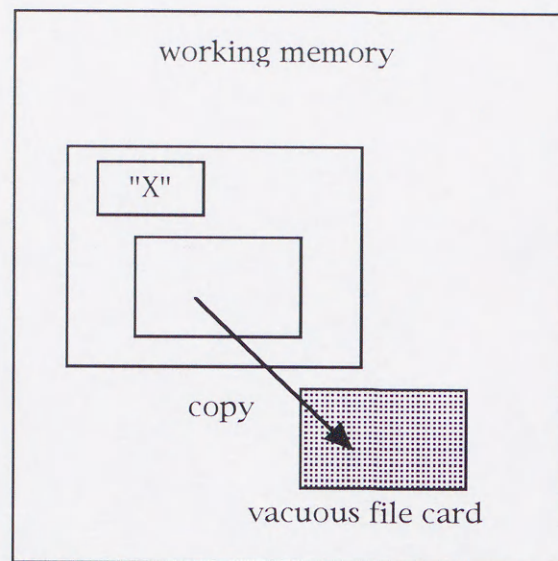


Figure 8. The "vacuous" *mo*

The least entity interpretation of *mo* is followed from the existence of the parallel pair. The existence of the parallel pair implies that there is not only one. The use of the least form implies the whole set belonging to the least form. In (33a), if the speaker and the hearer have the mutual knowledge that Taro is the most unlikely person to give a letter to Mary, the sentence implies that everyone in a group belonging to Taro gave a letter to Mary. Thus, the least entity interpretation is not a function of *mo*, but is followed from the mutual knowledge of the speaker and the hearer.

3.4 Some Other Particles

In this section, we will see some other particles sensitive to information-processing, and try to account for their properties in the model of information-processing.

3.4.1 *Nara* and *Kara*

Akatsuka (1985) points out that the particle *nara* is attached to the "newly-learned information", while the particle *kara* is attached to the information that is stored in the speaker's knowledge.

(41) A: ぼく、冬のLSAに行くことにしたよ。

Boku, huyu no LSA ni iku koto ni shita yo.

'I am going to the Winter LSA.'

B: 君が行くなら/*から、ぼくも行くよ。

Kimi ga iku nara/*kara, boku mo iku yo.

'If you are going, I'm going, too.'

(After the conversation with A, B says to the other person C)

B: AさんがLSAに行く*なら/から、ぼくも行くよ。

A san ga LSA ni iku *nara/kara, boku mo iku yo.

'I'm going to LSA because Mr. A is going.'

These particles is sensitive to the state of information. In our information-processing model, Akatsuka's "newly-learned information" corresponds to the information stayed in the working memory, and the stored knowledge corresponds to the information stored in the episodic memory. Thus, we can account for the properties of *nara* and *kara* as follows: *nara* is attached to the information on a file card in the working memory at a given time, while *kara* is attached to the information on a file card retrieved from the episodic memory.

3.4.2 *Ne* and *Yo*

In conversation, *ne*, *yo* or both of them, is attached to the sentence-final position.

(42) a. 言語学、休講だね。

Gengogaku, kyuuko da *ne*.

'The lecture of Linguistics will be canceled.'

b. 言語学、休講だよ。

Gengogaku, kyuuko da *yo*.

c. 言語学、休講だよね。

Gengogaku, kyuuko da *yo ne*.

In (42a), the speaker assumes that the hearer knows that there is no lecture of linguistics; thus, this sentence is used in the context where the speaker asks the hearer whether it is certain or not. On the other hand, in (42b), the speaker assumes that the hearer does not know it; thus, this sentence is used in the context where the speaker tells the hearer what the hearer does not know. The use of *ne* or *yo* depends on the speaker's assumption of the hearer's knowledge. As discussed in Chapter 2, at the beginning of conversation, the folder of "here-and-now" is formed by default. It contains the information about the speaker, the hearer, and others which exist in the context. In conversation, it is easy for the speaker to access the information about the hearer, because the folder of the hearer is formed in the working memory, and the information about the hearer (file cards of the hearer) is retrieved from the episodic memory through the hearer's folder. If the speaker retrieves from his/her episodic memory the information that the hearer knows what the speaker want to talk about, the speaker attaches *ne* to the sentence-final position. If the speaker retrieves from his/her episodic memory the information that hearer does not know what the speaker want to talk about, the speaker attaches *yo* to the sentence-final position. If the speaker cannot retrieve from his/her episodic memory the information the

hearer knows what the speaker want to talk about (i.e., there is no information about it in his/her episodic memory), the speaker attaches *yo* and *ne* to the sentence-final position.

In Chapter 2, we take *ne* or *ka* as a monitor of the state of information. These sentence-final particles monitor the speaker's knowledge of the hearer, and retrieve the appropriate information. If the hearer offers the speaker the information that (s)he knows what the speaker talked about, the speaker stores it as a piece of information about the hearer in his/her episodic memory.

3.4.3 *Koto, No* and *To*

Kuno (1973) points out that the complement of "factive verbs" is marked with *koto* or *no*, while the complement of "non-factive verbs" is marked with *to*.

- (43) a. ジョンは[ビルがメアリーを愛していること/の]を知っている。

John wa [Bill ga Mary o aishite iru *koto/no*] o shitte iru.

'John knows that Bill loves Mary.'

- b. *ジョンは[ビルがメアリーを愛している]と知っている。

*John wa [Bill ga Mary o aishite iru] *to* shitte iru.

- (44) a. *ジョンは[ビルがメアリーを愛していること/の]を思いこんでいる。

*John wa [Bill ga Mary o aishite iru *koto/no*] o omoikonde iru.

'John thinks that Bill loves Mary.'

- b. ジョンは[ビルがメアリーを愛している]と思いこんでいる。

John wa [Bill ga Mary o aishite iru] *to* omoikonde iru.

The verb *shitte iru* 'know' is a factive verb in the sense that the verb

presupposes that the content of its complement is true, while the verb *omoikonde iru* 'think' is a non-factive verb in the sense that the verb does not presupposes it. In the literature of pragmatics, the "factivity" is not truth-conditional, but the speaker's state of information (see Levinson (1983)). Thus, the use of *koto/no* or *to* depends on which the speaker retrieves information from. If the information represented by a complement of a verb is retrieved from the "early" episodic memory, it is marked with *to*, while if the information represented by a complement of a verb is retrieved from the "permanent" semantic or episodic memory, it is marked with *koto* or *no*. In the case of (44), the information about the fact that Bill loves Mary is stored in the speaker's "early" episodic memory. In other words, the information stays as a file card in the "early" episodic memory and has not been stored in the "permanent" episodic memory. Thus, it is marked with *to*. On the other hand, in the case of (43), the information about the fact that Bill loves Mary has already been stored in the "permanent" episodic memory. Thus, it is marked with *koto* or *no*.

3.4.4 Zero Particles

In conversation, we often "drop" particles, as shown in the following examples.

(45) 「ああ、しまった。枝はらいの仕事 \emptyset 途中で投げ出してきたんだった。」

Aaa, shimattaa. Eda-harai no shigoto \emptyset tochu de nagegashite
kitandaa.

'Oh, shit! I've not finished the job of cutting off branches.'

(*Mainichi ga natsuyasumi*, Yumiko Oshima)

(46) 「わたし \emptyset きょうあなたと会えてよかったわ。」

Watashi o kyoo anata ni aete yokatta wa.

'I was glad to see you today.'

(*Mainichi ga natsuyasumi*, Yumiko Oshima)

Maruyama (1996) points out that the particle-drop phenomenon is divided into two cases: the one is taken as dropping a case particle; the other is taken as a "topical" element. The following examples are cited from Maruyama (1996).

(47) a. 函館で「イカソーメン」 o 食べるの忘れたでしょ。

Hakodate de "ika soomen" o taberu no wasureta desyo.

'You forgot eating "ika soomen" in Hakodate, didn't you?'

b. この手袋 o、だれが買ってくれたの。

Kono tebukuro o, dare ga katte kureta no.

'Who bought this gloves for you?'

Maruyama takes (47b) as a drop of the case particle *o*, but not (47a). In this section, we will shed light on the case of (47b). The examples presented as (45) and (46) are taken as the same as (47b). Let us call the case of these examples "zero particle". Onoe (1987, 1996) observes that the sentence which contains a zero particle has a different "meaning" from the one which contains *wa* or *ga*.

(48) a. はさみ o ある？

Hasami o aru?

'Do you have a pair of scissors?'

b. はさみはある？

Hasami wa aru?

c. はさみがある？

Hasami ga aru?

According to Onoe (1996), (44b) is used in the context where the speaker asks the hearer whether there is a pair of scissors, not a knife nor a razor; or whether the hearer has the scissors that they have so far talked about. On the other hand, (44c) is used in the context where the speaker assumes that there is a pair of scissors and makes sure whether there is a pair of scissors. In our information-processing model, we will account for these implications. The particle *wa* as a folder-activator presupposes that the folder named as a given entity has been formed in the working memory at a given time, and if there are entities that competes with the entity in the working or episodic memory, the "contrastive" interpretation arises. The particle *ga* selects the most salient entity in the working memory, and if we use *ga*, the "exhaustive-listing" interpretation arises.

When we use zero particles, no folder is formed in the working memory. As far as keeping a folder active is a default process (see Chapter 2), forming or reactivate a folder forces the hearer to spend processing resources. The use of zero particles in conversatioin is to avoid imposing some costs on the hearer.

3.5 Particles as Information-Managers

The particles discussed above involve the procedural meaning to access a particular state of information in the memory system. The particle *wa* reactivates a decayed or deactivated folder in the working memory, *ga* selects the most salient entity in the working memory and enters it on the subject slot in a file card, and *mo* forms an folder in the working memory and copies the content of a file card in the working memory except the linked entity in the file card. These information-sensitive particles play the

role of the "manager" of how we process the information which is entered into from the outside world or retrieved from the episodic or permanent semantic memory. Our model of information-processing and memory system gives an appropriate account to the properties of these particles.

Chapter Four

Anaphora System in Japanese

4.0 Introduction

In this chapter, we will shed light on the anaphora system in Japanese. Not only Japanese but also every human language has some different types of referring expressions, although the properties of referring expressions vary from language to language. Observe the following example of Japanese.

- (1) 泰彦の世間的な肩書きは、一応、音楽ライターとか作詞家となっている。∅
以前は、音楽雑誌の編集部に籍を置いていた。∅フリーになったのは、四年
前からだ。それ以来、初対面の人間、しかも彼の仕事に通じていない人間に
自分の職業を説明するとき、泰彦はきまって困惑してしまう。

Yasuhiko no seken-teki na katagaki wa, ichioo, ongaku-raitaa toka sakkyokuka to natte-iru. ∅ Izen wa, ongaku-zasshi no henshuubu ni seki o oite ita. ∅ Furi ni natta no wa, yonen-mae kara da. Sore-irai syotaimen no ningen, sikamo kare no shigoto ni tuujite iani ningen ni jibun no syokugyoo o setuse-suru toki, Yasuhiko wa kimatte konwaku site shimau.

'Yasuhiko's title is a music writer, or composer. He belonged to an editorial department of a music magazine before. He has been a free writer since four years ago. Since then, he is at a loss whenever he explains his job to the person who has not seen and is not well informed about his job.'

(1966 *nen*, *fuyu*, *heart break hotell*, Takeshi Kamewada)

In (1), the person named as *Yasuhiko* is represented by four types of different referring expressions: a proper noun (*Yasuhiko*), a zero pronoun (\emptyset), a personal pronoun (*kare*), and a reflexive pronoun (*jibun*). Why does human language have some different forms that refer to the same thing or person? This is why different forms of referring expression refer to the thing or person in different information status. Referring expressions involves procedural information on how to refer to an entity. In this chapter, we will account for the properties of referring expressions in Japanese in the model of information-processing presented in Chapter 2.

4.1 Zero Pronouns

4.1.2 The Properties of Zero Pronouns

Japanese allows to appear a null (non-lexical) element in an argument position. The null element is coreferential with an entity that exists in the context or appears in the preceding or following discourse. Let us call the null element a "zero pronoun". In this section, we will observe the properties of zero pronouns.

Zero pronouns generally appear in the subject or object position, and hardly appear in other oblique grammatical positions.

- (2) リトルバラは本を手に立ち上がった。 \emptyset_1 せまい受付を通り、 \emptyset_2 玄関へ出た。
だれも \emptyset_3 追ってこなかった。

Ritorubara wa hon o te ni tachiagatta. \emptyset_1 semai uketsuke o toori,
 \emptyset_2 genkan e deta. Daremo \emptyset_3 otte konakatta.

'Ritorubara stood up having a book with her hand. She walked

through the small information desk, and entered to the entrance.
No one pursued her.'

(*Nichibotsu mae ni hasshin seyo*, Ryu Mitsuse)

- (3) 私は一瞬のスキを突いて店の銭箱から百円を盗った。銭箱の引き出しがガ
チャリと音をたてたので母が振り向き、ø₁「あっ、こらっ」と怒ったが、ø₂
ø₃ どうせ怒られるのなら ø₄ ø₅ あとで怒られればよい。

Watashi wa issyun no suki o tsuite saisenbako kara hyakuen o
totta. Zenibako no hikidashi ga gatyari to oto o tateta node haha ga
hurimuki, ø₁ "a, kora" to okotta ga, ø₂ ø₃ doose okorareru nara, ø₄
ø₅ atode okorarereba yoi.

'I stole 100 yen from the money box. My mother returned to see
me because the drawer of the money box made a clicking noise.
She shouted with angry. I thought it was better to be scolded later
than now'

(*Ano koro*, Momoko Sakura)

In (2), the zero pronouns of ø₁ and ø₂ appear in the subject position, while
the one of ø₃ appear in the object position. In (3), the zero pronouns of ø₃
and ø₅ appear as the implicit agent in the passive sentence. The zero
pronoun appear in the oblique grammatical position is statistically much
fewer than the one in the subject or object position (see Akizuki (1996)).

The antecedent of a zero pronoun appears at close range in discourse. Zero
pronouns generally have their antecedent in the immediately previous or
following clause (In Akizuki (1996), I showed that the rate of the
immediately previous antecedent of the zero pronoun is 69.7 % in the
written texts) . The following example is the case of "backward anaphora".

- (4) ϕ 背後の足音に気付いたとき、一瞬照子はゾッとして足がすくんだ。

\emptyset haigo no ashioto ni kizuita toki, issyun Teruko wa zotto shite ashi ga sukunda.

'When she noticed footsteps behind her, Teruko was scared and cowered.'

(*Mikeneko Hoomuzu no eiyuudensetsu*, Jiro Akagawa)

Kameyama (1988) observes that zero pronouns tends to share as many grammatical or functional properties as possible. If a zero pronoun appear in the subject position, the following one coreferred with it tends to appear in the same position. If a zero pronoun appear in the "point-of-view" position, the following one coreferred with it tends to appear in the same position. The following example is cited from Kameyama (1988).

- (5) a. 正夫_i はアラビア語を習っている。

Masao_i wa Arabia go o naratte iru.

'Masao is learning Arabic now.'

- b. ある日、アラビア人の女性_j に会った。

Aruhi, \emptyset _i [Arabia jin no josei]_j ni atta.

'One day he met an Arabian lady.'

- c. \emptyset _j \emptyset _i いろいろ親切にしてくれた。

\emptyset _j \emptyset _i iroiro shinsetsu ni shite kureta.

'She was very kind to him.'

In the senyence of (5c), *kureru* 'give' is a marked verb, which takes the dative as the "point-of-view" person (cf. unmarked verbs take the subject as the "point-of-view person). The zero pronoun in the dative position in (5c) is coreferential with the zero pronoun which appears in the subject and the

"point-of-view" position in (5b). This suggests that zero pronouns tends to be coreferential with ones that share the same functional properties. This fact is observed in the sentence-internal (not discourse) level. The following examples are cited from Muraki and Kubota (1988).

(6) a. ジョン_i はビルが \emptyset_i お金をくれたと言った。

John_i wa [Bill ga \emptyset_i okane o kureta] to itta.

'John said that Bill gave him the money.'

b. ジョン_i はビルが \emptyset_i なぐりかかってきたと言った。

John_i wa [Bill ga \emptyset_i naguri-kakatte kita] to itta.

'John said that Bill came to hit him.'

(7) a. *ジョン_i はビルが \emptyset_i お金をやったと言った。

*John_i wa [Bill ga \emptyset_i okane o yatta] to itta.

'John said that Bill gave him the money.'

b. *ジョン_i はビルが \emptyset_i なぐりかかっていったと言った。

*John_i wa [Bill ga \emptyset_i naguri-kakatte itta] to itta.

'John said that Bill go to hit him.'

In (6), *kureta* 'receive' and *kita* 'come' are marked verb, which takes the dative as the "point-of-view" person. Thus, the zero pronouns in the dative position can be coreferential with the subject of the main clause, which is a "point-of-view" person. In (7), *yatta* 'give' and *itta* 'go' take the subject as the "point-of-view" person. Thus, the zero pronouns in the dative position cannot be coreferential with the subject of the main clause.

Kuno (1978) observes that the antecedent of a zero pronoun must be "recoverable" from the preceding context (c.f. Kuno does not use the term of

the zero pronoun. He uses the term of the "ellipsis").

(8) A: 太郎がそんなこと言うはずがない。

B: ϕ この前来たとき、太郎がちゃんとそう言っていましたよ。

A: Taro_i ga sonna koto iu hazu ga nai.

'Taro is not a person who said so.'

B: \emptyset_i kono mae kita toki, Taro_i ga chanto so itte mashita yo.

'When he came before, Taro said so.'

(9) A: だれがそんなこと言っていたのです。

B: ?? ϕ この前来たとき、太郎がちゃんとそう言っていたのです。

A: Dare ga sonna koto itte ita no desu.

'Who said so?'

B: ?? \emptyset_i kono mae kita toki, Taro_i ga chanto so itte ita no desu.

'When he came before, Taro said so.'

In (8B), the antecedent of the zero pronoun in the adverbial clause is recoverable, because the antecedent *Taro* appears in the utterance of A, whereas in (9B), it is unpredictable, because the utterance of A introduces no entities to be the antecedent of the zero pronoun.

To sum up, the properties of zero pronouns are as follows.

- (i) Zero pronouns generally appear in the subject or object position.
- (ii) Zero pronouns generally have their antecedent in the immediately previous or following clause.
- (iii) Zero pronouns are subject to the functional constraints (the property-sharing constraint by Kameyama (1988) or the recoverability constraint by Kuno (1978)).

4.1.3 Zero Pronoun as an Active Folder Pointer

In this section, we will try to account for the properties of zero pronouns in the model of information-processing. We suggest that a zero pronoun refers to the name of the active folder in the working memory at any given time. As assumed in Chapter 2, only one folder can be active at a any given time. This assumption warrants that the antecedent of a zero pronoun is uniquely determined. The function of a zero pronoun is schematically represented in Figure 1 below.

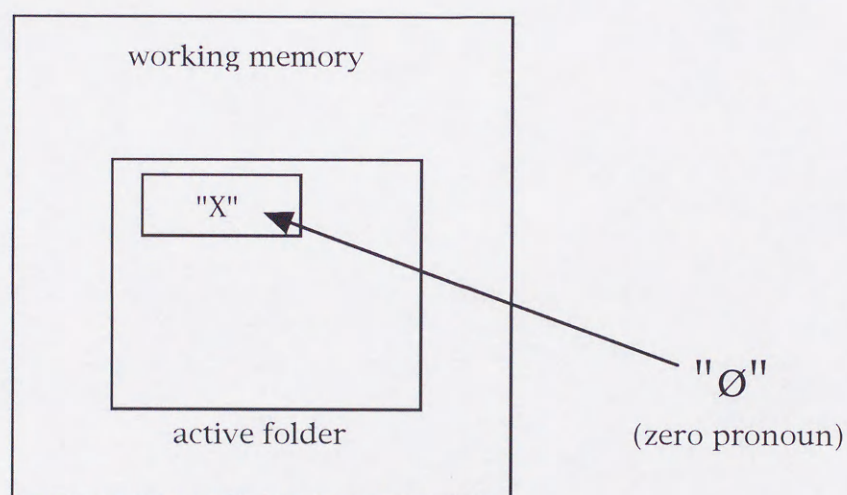


Figure 1. Zero pronoun as an active folder pointer

The information-processing model presented in Chapter 2 accounts for the properties of the zero pronouns. In general, the folder is named as the most salient entity in an event or state. The most salient entity is linked to the subject slot on a file card, and the next salient entity is linked to the object slot on a file card. This accounts for the property of (i). Furthermore, the name of the active folder corresponds to a topic or a "point-of-view" person at any given time. This accounts for the fact that zero pronouns are subject

to the property-sharing condition. We assumed in Chapter 2 that as soon as a file card is filled with the information conveyed by a (string of) sentence, the file card is stored onto the episodic memory. This assumption accounts for the property of "backward anaphora" of zero pronouns. As presented in (4), the antecedent of a backward zero pronoun is generally in the immediate preceding clause. We assumed in Chapter 3 that the unspecified folder can be formed in the working memory, and that at the beginning of fiction text, the unspecified folder is formed by default. The examples of (4) is just the case of the beginning of a fiction text (In Akizuki (1997), I observe that the backward zero pronoun appear only in the beginning of fiction text). In order to store a file card in the episodic memory, all of the content of a file card is specified. This accounts for the fact that the antecedent of the backward zero pronoun appear in the immediate preceding clause.

The zero pronoun is the least quantity of item. We assume in Chapter 2 that keeping a folder active is a default process. The use of the zero pronoun as an active folder pointer means that a default process is managed by the least cost.

4.2 *Kare/Kanojo*

4.2.1 The Properties of *Kare/Kanojo*

In much of linguistic literature, *kare/kanojo* has been so far treated as a third-person pronoun, which corresponds to *he/she* in English. In this section, we will see the properties of *kare/kanojo*, and point out that the properties of *kare/kanojo* does not correspond to that of *he/she*.

What we will point out first is that the use of *kare/kanojo* is not stable

among native speakers of Japanese. The usage of *kare/kanojo* varies from person to person and from place to place. In general, the child, before entering a junior high school, does not use *kare/kanojo*. I think that this is followed from the fact that Japanese students learn *kare/kanojo* as a literal translation of *he/she* in an English class in a junior high school. In what follows, we will observe not only fairly stable but also unstable (dialect) properties of *kare/kanojo*.

Kare/kanojo refers to the person who has been presented in the context or introduced in the preceding discourse. (10) is an example in conversation; (11) is one of written text.

(10) 「何その女子大生とできちゃったってわけなの」

(中略)

「彼女の名誉のために言うけど...」

"Nani sono joshidaisei to dekichatta tte wake na no"

'You are in love with the college girl, aren't you?'

(some sentences)

"*Kanojo* no meiyō no tameni iu kedo ..."

'I'll say for her honor, ...'

(*Shinju no wake*, Mariko Hayashi)

(11) 乾いた砂がリトルバラの咽喉や肺を犯し、彼女は激しくせきこんだ。

Kawaita suna ga Ritorubara no inkoo ya hai o okasi, *kanojo* wa hageshiku sekikonda.

'The dry sand invaded Ritorubara's throat and lungs, and she had a fit of coughing.'

(*Nichibotus-mae ni hasshin seyo*, Ryu Mitsuse)

Hoji (1991) points out that *kare/kanojo* cannot be construed as a bound

variable.

(12) a. *だれか_i が彼_i のかばんをなくした。

*Dareka_i ga kare_i no kaban o nakushita.

'Someone lost his bag.'

b. *だれ_i が彼_i のかばんをなくしたの。

*Dare_i ga kare_i no kaban o nakushita no?

'Who lost his bag?'

According to Hoji, however, *kare/kanojo* can be bound to *dono hito* 'which person'.

(13) ?どの大学生_i が彼_i のかばんをなくしたの?

?Dono danshigakusei_i ga kare_i no kaban o naushita no?

'Whish college student lost his bag?'

Although Hoji judges (13) as "grammatical", his judgement is not supported by every Japanese native speaker. For not a few Japanese native speakers (including me), *kare* in (13) is construed to refer to another person in the context.

In Akizuki (1996), I pointed out that in written text, *kare/kanojo* cannot refer to the person that a point-of-view person does not know. In written text, *sono hito/otoko/onna* 'that person/man/woman' is used to refer to such a person.

(14) 小学校の帰り道、見るからに怪しげな男が何か得体の知れないものを売っていることが時々あった。(中略) だが、その男の前で足を止めてしまうのである。

Shogakko no kaeri-michi ni, mirukani ayashigena otoko ga nanika etai no shirenai mono o utte iru koto ga tokidoki atta.

'On the way to home from the elementary school, a man who seems to be unreliable used to sell something strange.'

(some sentences)

Daga, *sono otoko* no mae de ashi o tomete shimau no de aru.

'However, everyone could not help stopping in front of him.'

(*Ano koro*, Momoko Sakura)

In (14), if *sono okoto* is placed to *kare*, this sentence implies that the writer knows who the man is.

Kare/kanojo cannot refer to a little child. In general, *kare/kanojo* refer to an adult. The following example is an invented one.

- (15) 山田さんのところに男の子が生まれた。?彼/その子は山田さんにととてもよく似ている。

Yamada san no tokoro ni otokonoko ga umareta. ?*Kare/Sono ko* wa Yamada san ni totemo yoku nite iru.

'A boy baby was born to Yamada. He resembles Yamada very much.'

Kare/kanojo can be attached by a clausal element (see Chapter4).

- (16) 日本における世界的巨匠として有名な彼のことだから、スケールの大きいシ賞をうけたのは当然という評判だった。

Nihon ni okeru sekai-teki kyosho toshite yuume na *kare* no koto da kara, sukeeru no ookii shoo o uketa no wa toozen to iu hyooban datta.

'Since he is well-known as a world-wide great man of Japan, it is said that they takes for granted that he received the great prize.'

(*Yume no irodori*, Tomomi Muramatsu)

- (17) そんなことを身近に話す彼女を見ていると、彼女の意図を推しはかろうとあ

せているいつものぼくの行動がまったくの徒労のように思えてくる。

Sonna koto o mujakini hanasu *kanojo* o mite iru to, *kanojo* no ito o oshihakaroo to asette iru itsumo no boku no koodoo ga mattaku no toroo no yooni omoete kuru.

'Looking at her, who told it innocently, I think it is no use that I always try to read her thought.'

(1966 *nen*, *fuyu*, *heart break hotel*, Takeshi Kamewada)

The young people, in general, use *kare/kanojo* to represent one's boy/girl friend (*Kare* is often placed with *kareshi*, recently).

(18) 「いいなあ、富士子さんには花園君、... 籐堂さんにも彼がいて...」

"Iinaa. Fujiko san ni wa Hanazono kun ... Toodoo san ni mo *kare* ga ite ..."

'How I envy them! Fujiko is in love with Hanazono, and Toodo has a boy friend, ...'

(*Yawara!*, Naoki Urasawa)

(19) 「だって才ちゃん、もともと同級生の彼女いたでしょ？」

"Datte Sai chan, motomoto dokyuusei no *kanojo* ita desho?"

'Because you had a girl friend, who is your classmate, do you?'

(*Kiss + πr2*, Fusako, Kuramochi)

Takubo (1997) observes that *kare/kanojo* can refer to the hearer in conversation (Kansai dialect). The following examples are cited from Takubo (1997).

(20) a. 彼女、茶飲み行かへんか。

Kanojo, cha nomi ni ikahen ka.

'Let's go to have some tea.'

b. これ、彼のんちゃう。

Kore, *kare* no n chau.

'Is this yours?'

The use of *kare/kanojo* gives the hearer/reader the "literary" or "affected" implication in conversation. To avoid such implication, we often use *aitsu*, *ano hito/otoko/onna*, or a personal name instead of *kare/kanojo*.

To sum up, the properties of *kare/kanojo* are as follows.

- (i) *Kare/kanojo* refers to the person who has been presented in the context or introduced in the preceding discourse.
- (ii) *Kare/kanojo* cannot be construed as a bound variable.
- (iii) In written text, *kare/kanojo* cannot refer to the person that a point-of-view person does not know.
- (iv) *Kare/kanojo* cannot refer to a little child.
- (v) *Kare/kanojo* can be attached by a clausal element.
- (vi) *Kare/kanojo* is used to represent one's boy/girl friend.
- (vii) *Kare/kanojo* can refer to the hearer in conversation (Kansai dialect).
- (viii) The use of *kare/kanojo* gives the hearer/reader the "literary" or "affected" implication in conversation.

The properties of (i), (ii) and (v) are shared by all of the native speakers of Japanese. The properties of (iii), (iv), (vi) and (viii) are shared by most of them. The property of (vii) is a dialect one in Kansai. The property of (i) only corresponds to the one of *he/she* in English.

4.2.2 *Kare/kanojo* as an Indirect Pointer

In this section, we will try to account for the properties of *kare/kanojo* in the model of information-processing. *Kare/Kanojo* indirectly refers to an entity

in the working memory by referring to the same (linked) entity stored in the episodic memory. The function of *kare/kanojo* is schematically represented in Figure 2 below.

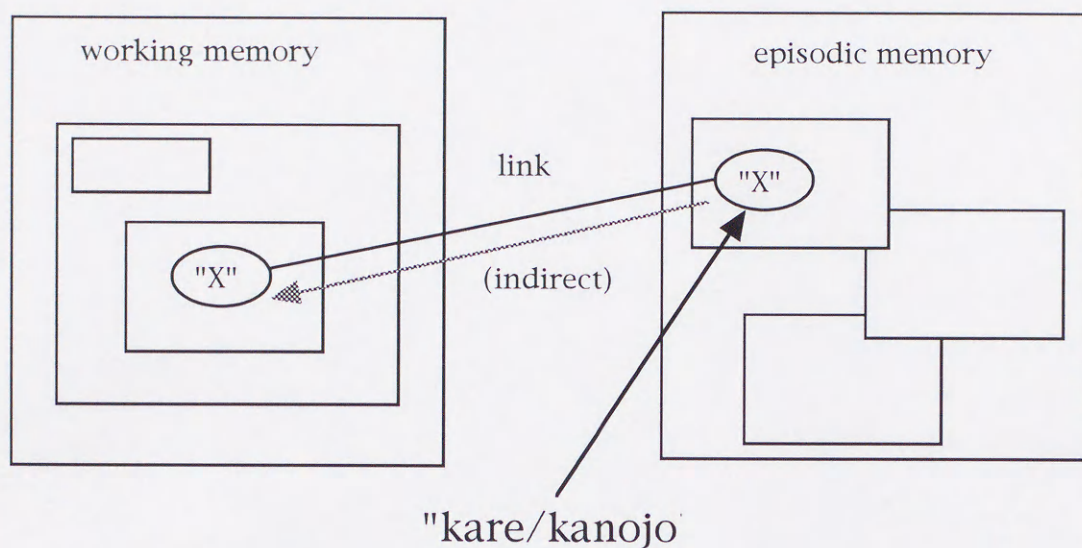


Figure 2. *Kare/kanojo* as an indirect pointer

The link between an entity in the working memory and one in the episodic memory warrants that the directly pointed entity in the episodic memory is uniquely determined. The assumption that *kare/kanojo* refers to an entity in the episodic memory accounts for the properties of (ii) and (iii). We assumed in Chapter 2 that in the episodic memory, the information that the speaker/writer has so far experienced is stored as file cards. This means that *kare/kanojo* refers to the person who the speaker/writer has met or heard about in his/her experience. Note that as discussed in Chapter 2, file cards are stored in the episodic memory, as soon as a file card is filled with information in the working memory. Thus, *kare/kanojo* can refer to the person who is mentioned in the immediately previous discourse, as long as the file card that contains the information of him/her is stored in the

episodic memory. However, *kare/kanojo* cannot be bound to an indefinite phrase, because the bound variable interpretation is a sentence-internal phenomenon. The "indefinite" person is not stored in the episodic memory, as long as a sentence ends.

Kare/kanojo includes not only procedural but also conceptual meaning. In general, *kare* is used to refer to a male person, while *kanojo* is used to refer to a female person, and most of the native speaker of Japanese use *kare/kanojo* to refer to an adult. *Kare* and *kanojo* are specified as follows.

(21) *Kare*

conceptual meaning: ([MALE]), [HUMAN], ([ADULT])

procedural meaning: point an entity in episodic memory, and
link it to the active entity in the working
memory.

Knojo

conceptual meaning: [FEMALE], [HUMAN], ([ADULT])

procedural maaning: point an entity in episodic memory, and
link it to the active entity in the working
memory.

There is a few native speakers of Japanese to use *kare* to refer to both a male and female person. This is why [MALE] in *kare* is put in parentheses. The specification of (21) accounts for the property of (iv).

We have assumed that there is a clear distinction between conceptual and procedural meaning in lexical items. However, there is no reason to believe a priori that there is such a distinction (see Espinal (1997)). The properties of (vi) rises from the arbitrariness of conceptual and procedural meaning. The native speakers of Japanese who use *kare/kanojo* to represent one's

boy/girl friend incorporate the procedural information into the conceptual information. The procedural meaning of referring to an entity in the episodic memory is converted to the conceptual meaning of "memorial".

(22) *Kare*

conceptual meaning: [MALE], [HUMAN], [ADULT], [MEMORIAL]

procedural meaning: \emptyset

Kanojo

conceptual meaning: [FEMALE], [HUMAN], [ADULT], [MEMORIAL]

procedural meaning: \emptyset

Kare and *kanojo* as a boy/girl friend are used by the opposite sex, respectively. A male person uses *kanojo* to refer to his girl friend, and a female person uses *kare* to refer to her boy friend. Thus, if a female person uses *kare*, it refers to the person who is male and the most memorial one in recent days, who is a boy friend.

In the Kansai dialect use, *kare/kanojo* functions as a vocative. As long as we know his/her name, we generally use his/her name to address a person. In this case, we access the episodic memory, and retrieve the entity with using the name as a "key". However, in (20), the speaker does not know the name that (s)he wants to address. The speaker can refer directly to a person in his/her presence to use *so* (e.g. *soko no hito*) (see section 4.3), but such direct reference gives the addressee "rude" or "impolite" impression. *Kare/kanojo* refers indirectly to the entity. The indirect reference of *kare/kanojo* avoids giving the addressee "rude" or "impolite" impression. This is why *kare/kanojo* is used to address an unknown person.

The property of (viii) is attributed to the implicature that rises from the indirectness of the reference of *kare/kanojo*. Pointing an entity indirectly

causes the "literary" or "affected" implication.

To sum up, the stable properties of *kare/kanojo* are followed from the distinction of the conceptual and the procedural information, and the unstable properties are attributed to the possibility of shift of the procedural information to conceptual information, or to the implicature rises from the indirectness of reference of *kare/kanojo*.

4.3 *Ko, So and A*

The linguistic literature has distinguished two uses of *ko*, *so* and *a*. One is to refer to a thing or person that exists in the context (by pointing at it); the other is to refer to a thing or person that introduced in the preceding discourse. We will call the former the direct-pointing use, and the latter the anaphoric use.

4.3.1 The Direct-Pointing Use of *Ko, So and A*

Mikami (1970) points out that the direct-pointing use of *ko*, *so* and *a* is distributed into two distinct dimensions. One is the dimension in which the speaker is opposed to the hearer; we call it the "speaker-hearer dimension". In this dimension, *ko* refers to a thing or person that is close to the speaker, while *so* refers to a thing or person that is close to the hearer. The other is the dimension in which the community of the speaker and hearer is opposed to the outside of them; we call it the "inside-outside dimension". In this dimension, *ko* refers to a thing or person that belongs to the speaker-hearer's community, *a* refers to a thing or person outside the community.

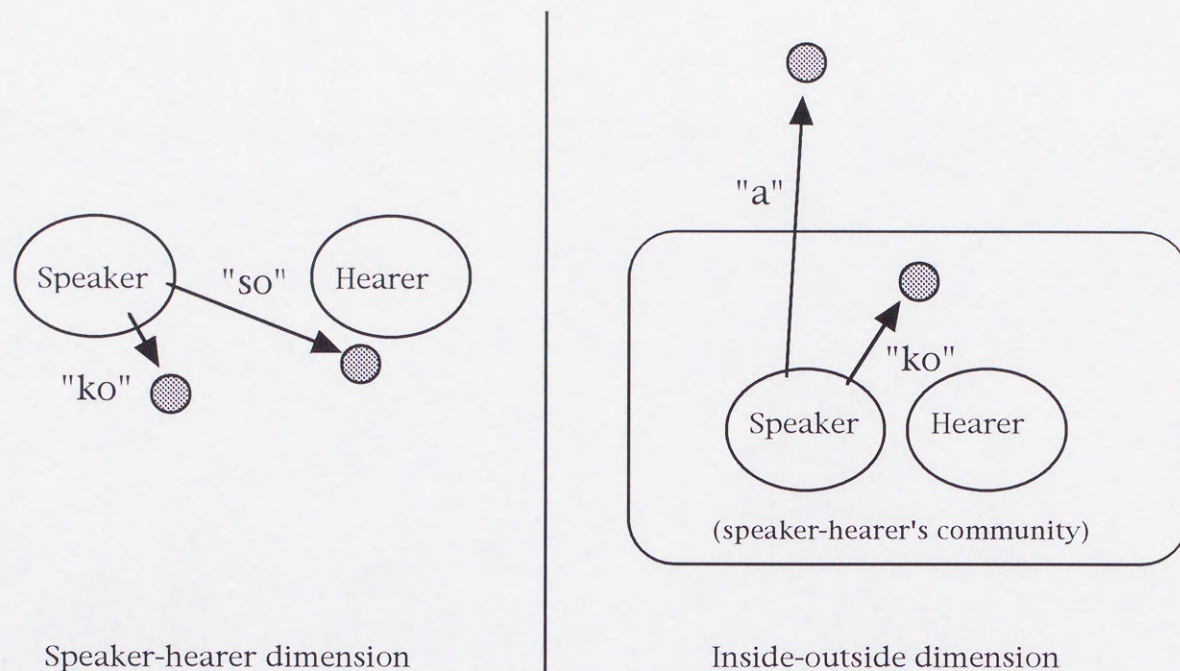


Figure 3. Two dimensions of *ko*, *so* and *a*

According to Mikami (1970), the evidence of the two dimensions is that there are some idiomatic expressions like *ko + so* and *ko + a*, but no ones like *so + a*.

- (23) a. ここそこ、そうこうするうちに、...
 koko soko, soo koo suru uchi ni, ...
 'here and there, while doing so'
- b. あちらこちら、ああ言えばこう言う、...
 achira kochira, aa ieba koo iu, ...
 'here and there, if I said so you say so.'
- c. *こちらあちら、ああそう、...
 *kochira sochira, *aa soo, ...

4.3.2 The Anaphoric Use of *Ko*, *So* and *A*

4.3.2.1 The Properties of the Anaphoric Use of *Ko*, *So* and *A*

So or *ko* can refer to the thing or person that has been presented in the context or introduced in the preceding discourse.

- (24) 母は毎年秋になると、庭に咲いた菊を摘み、茹でてから、いくつものボール状にして、宅急便で届けてくれたものだ。それを冷凍にしておいて、幾度も分けて馳走になった。

Haha wa maitoshi aki ni naru to, niwa ni saita kiku o tsumi, yudete kara, ikutsu mo no booru-jo ni shi te, takkyuubin de todokete kureta monoda. *Sore* o reitoo ni site oite, ikudo ni mo wakeke chisoo ni natta.

'Whenever fall has come, my mother used to pick chrysanthemums in the garden, boil them, make balls of them, and send them to us by home delivery. We froze them, and ate them many times.'

(*Haha no kiku*, Ryuichiro Utsumi)

- (25) 「お互い、今の自分から脱皮しようとしている同志。」

「それは言えるな。」

"Otagai, ima no jibun kara dappi shiyoo to shite iru dooshi."

'We are kindred spirits in trying to break ourselves.'

"*Sore* wa ieru na."

'I think so.'

(*Yume no irodori*, Tomomi Muramatsu)

- (26) 歯がなくてよくしゃべれますねえと、これも常々聞かれるが、少しずつ歯が欠けていったせいか、しゃべる技術が低下せずすんだ。

Ha ga nakute yoku shabere masu nee to, *kore mo* tunezune
kikareru ga, sukoshizutsu ha ga kakete itta seika, shaberu gijutsu
ga teika sezu ni sunda.

'They often tell me that I can speak well without the teeth, but I
do not lose the ability to speak because the tooth is gradually lost.

(*Yokogao-shasin*, Akira Hayasaka)

(27) 「ここ何日も、ぼくはおかしいんです。仕事をしている以外は、ずっと彩子
さんのことを考えてました。久しぶりですよ、こういう気持ち。」

"Koko nan nichi mo, boku wa okashiin desu. Shigoto o shite iru igai
wa, zuutto Ayako san no koto o kangaete mashita. Hisashiburi
desu yo, *koo iu* kimochi."

'I am strange these days. I think of Ms. Ayako except when I'm
working. I haven't have such feeling for a long time.'

(*Yasashii kotoba*, Shizuko Todo)

In conversation, *ko* and *so* can refer to the thing or person that the speaker
has presented by himself/herself, but *ko* cannot refer to the thing or person
that another person have presented; it must be referred to by *so*. In the
example of (25), *so* cannot be replace with *ko*. This fact has been observed
in Kuno (1973). The following example is cited by Kuno (1973).

(28) A: ぼくの友だちに山田という人がいるんですが、この男がなかなかの理論
家で、...

Boku no tomodachi ni Yamada toiu hito ga iru n desu ga, *kono*
otoko wa nakanaka no rironka de, ...

'Yamada, who is a friend of mine, is a theorist, ...'

B: ああ、その/あの/*この人なら、ぼくもよく知ってますよ。あの/*その/*
この人はずいぶん議論好きですね。

Aa, sono/ano/*kono hito nara, boku mo yoku shitte imasu yo.

Ano/*sono/*kono hito wa zuibun giron-zuki desu ne.

'Yes, I know him well. He likes discussing very much.'

In (28), the speaker A can use *ko* to refer to the person who he himself introduced in the discourse, while the speaker B cannot use *ko* to refer to the person who the speaker A introduced in the discourse. Furthermore, Kuno (1973) points out that the anaphoric use of *ko* gives the hearer/reader the implication that the thing or person that *ko* is refer to seem to exist under his/her nose.

Ko can be used as the "backward anaphora". In (28), *konna* is used to refer to the following quotation.

(29) 青い鳥のモーリス・メーテルリンクがこんな言葉を残している。「この惑星
では人間はひたすら孤独な存在だ。」

Aoi tori no Morris Meterlink ga *konna* kotoba o nokoshite iru.

"Kono wakusei de wa ningen wa hitasura kodoku na sonzai da."

'Morris Meterlink, who wrote *The Blue Bird*, said as follows.

"Human being is a lonely existence on this planet."

(*Tenseijingo*, 1995.5.9)

Kuno (1973) observes that the anaphoric use of *so* and *a* depends on the mutual knowledge of the speaker and hearer. According to Kuno, *ano hito* refers to the person that the speaker assumes that the hearer knows, while *sono hito* refers to the person that the speaker assumes that the hearer does not know, or the person that the speaker does not know well. The following examples are cited by Kuno(1973).

(30) A: きノウ、山田さんに会いました。あの/その人、いつも元気ですね。

Kinoo, Yamada san ni ai mashita. *Ano/*Sono* hito, itsumo

genki de su ne.

'I met Mr. Yamada yesterday. He is always fine.'

B: 本当にそうですね。

Hontoo ni soo desu ne.

'I think so.'

(31) A: きのう山田さんという人に会いました。その/*あの人、道に迷っていたので、助けてあげました。

Kinoo Yamada san toiu hito ni ai mashita. Sono/*Ano hito, michi ni mayotte ita node, tasukete age mashita.

'I met Mr. Yamada yesterday. He lost his way, and I helped him.'

B: その/*あの人、髭をはやした中年の人でしょ。

Sono/*Ano hito, hige o hayashita chuunen no hito de syo.

'He is a middle-aged man and wears a mustache.'

(32) A: きのう山田さんという人に会いました。その/*あの人、道に迷っていたので、助けてあげました。

Kinoo Yamada san toiu hito ni ai mashita. Sono/*Ano hito, michi ni mayotte ita node, tasukete age mashita.

'I met Mr. Yamada yesterday. He lost his way, and I helped him.'

B: その/*あの人、どこに行くところだったのですか。

Sono/*Ano hito, doko ni iku tokoro datta no desu ka.

'Where is he going?'

In (30), the speaker A assumes that the hearer B knows Mr. Yamada; thus, the speaker A refers to him by *a*, not *so*. In (31), the speaker A assumes

that the hearer B does not know Mr. Yamada; thus, the speaker A refers to him by *so*, not *a*. In (32), the speaker B does not know Mr. Yamada; thus, the speaker B refers to him by *so*, not *a*. In Akizuki (1996), I pointed out that in written text, *sono hito/otoko/onna* tend to be used to refer to the person that a point-of-view person does not know. The relevant example has been presented in Section 4.2.1. Repeat here the example as (33).

(33) 小学校の帰り道、見るからに怪しげな男が何か得体の知れないものを売っていることが時々あった。(中略) だが、その男の前で足を止めてしまうのである。

Shogakko no kaeri-michi ni, mirukani ayashigena otoko ga nanika etai no shirenai mono o utte iru koto ga tokidoki atta.

'On the way to home from the elementary school, a man who seems to be unreliable used to sell something strange.'

(some sentences)

Daga, *sono otoko* no mae de ashi o tomete shimau no de aru.

'However, everyone could not help stopping in front of him.'

(*Ano koro*, Momoko Sakura)

A can refer to the thing, person or event that the speaker/writer has so far met, seen or experienced. In other words, A can refer to the entity stored in the speaker/writer's memory.

(34) 同時に香りが広がった。5年前とすこしも変わらない。あの菊の香りだった。

Dooji ni kaori ga hirogatta. Gonen mae to sukoshi mo chigawanai.

Ano kiku no kaori datta.

'At the same time, a smell spreaded. It was the same as that of 5 years ago. It was that smell of chrysanthemums'

(*Haha no kiku*, Ryuichiro Utsumi)

In (34), *ano kiku no kaori* 'that smell of chrysanthemums' refers to the smell of chrysanthemums in the writer's memory.

So can refer to an unspecified entity, or be bound to a nonreferential noun.

- (35) もしあの小切手を未知の人が本の中に発見したら、その人はどのようなドラマを想像しただろうか。

Moshi ano kogitte o michi no hito ga hon no aida ni hakken shitara, *sono hito wa dooiu dorama o soozoo shita daroo ka.*

'If an unknown person find that check in the book, what story does he imagine?'

(*Warui kuse*, Koji Meguro)

- (36) 健康食品とは、その名のとおり食べると健康によいとされている食品である。

Kenkoo-shokuhin to wa, sono na no toori taberu to kenkoo ni yoi to sarete iru syokuhin de aru.

'Health food is considered to be good for health as shown in its name.'

(*Momo no kanzume*, Momoko Sakura)

Neither *ko* nor *a* can be used to refer to a nonreferential noun. In the examples of (35) and (36), *sono* cannot be replaced with *ko* or *a*. However, the nonreferential use of *so* seems to be restricted to *sono*. *Sore* is difficult to use to be bound to a nonreferential noun. The nonreferential use of *sore* sounds like "translation".

- (37) 水虫と言えたいがいおっさんの持病であり、それにかかると油足におびただしい異臭を放ち、...

Mizumushi to ieba taigai ossan no jiboo de ari, *sore ni kakaru to*

aburaashi ni obitadashii ishuu o hanachi, ...

'The athlete's foot is a disease for middle-aged men. If we suffer from it, the feet gives off an offesive smell, ...'

(*Momo no kanzume*, Momoko Sakura)

To sum up, the properties of the anaphoric use of *ko*, *so* and *a* are as follows.

- (i) *Ko*, *so* and *a* can refer to the thing or person that has been presented in the context or introduced in the preceding discourse.
- (ii) *Ko* can be used as the "backward anaphora".
- (iii) *A* can refer to the thing or person stored in the speaker/writer's memory.
- (iv) In conversation, *ko* can refer to the thing or person that the speaker has presented by himself/herself, but cannot refer to the thing or person that another person have presented.
- (v) *So* refers to the thing or person that the speaker assemes that the hearer does not know, or the thing or person that the speaker does not know well.
- (vi) The anaphoric use of *ko* gives the hearer/reader the implication that the thing or person that *ko* is refer to seems to exist under his/her nose.
- (vii) *So* can refer to an unspecified entity, or be bound to a nonreferential noun, but *ko* and *a* cannot.

4.3.2.2 The Metaphorical Use of *Ko*, *So* and *A*

In this section, I will show that the anaphoric use of *ko*, *so* and *a* is a

metaphor of their direct-point use. The speaker-hearer dimension is mapped onto the transportation of baggage, and the inside-outside dimension is mapped onto the memory system.

4.3.2.2.1 The Metaphor of Flow of Information

It is well-known that the flow of information is a metaphor of the transportation of baggage. It is called "conduit metaphor" (see Lakoff and Jonson (1980)). The speaker/writer is mapped onto the sender, the hearer/reader is mapped onto the receiver, and the information that the speaker/writer conveys to the hearer/reader is mapped onto the baggage. This is schematically represented in Figure 4 below.

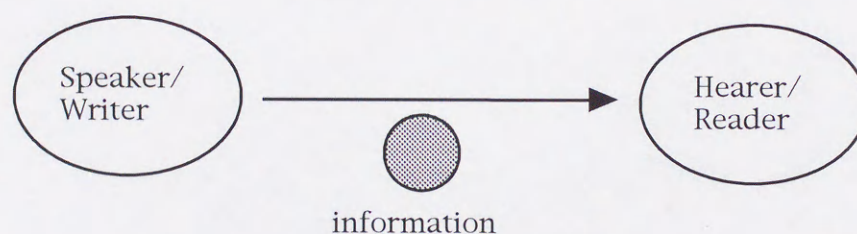


Figure 4. The flow of information

The speaker/reader assumes that the hearer/reader receives the information that (s)he has presented. This account for the fact that the thing or person that has been presented in the context or introduced in the preceding discourse is referred to by *so*, because *so* refer to the thing or person that is close to the hearer (see Figure 3). Furthrmore, this accounts for the fact that only *ko* can be used as the "backward anaphora". The information that has not been presented/conveyed yet is in the speaker/writer's memory. Thus, it is referred to by *ko*.

The flow of information is dynamic. Information starts from the reader/writer, moves toward the hearer/reader, and finally arrives at the hearer/reader. The speaker/writer assumes that the information that (s)he has just presented stays still at the place close to the speaker/writer. This account for the fact that the thing or person that has been presented in the context or introduced in the preceding discourse can be referred to by *ko*, and that the use of *ko* implies that the thing or person seem to exist under his/her nose. When the speaker/writer use *ko*, (s)he assumes that the information stays at the place close to him/her. This is supported by the observation that in the written text, the antecedent of the anaphoric *ko* tends to appear in the immediately previous clause (see Akizuki (1996)). The dynamic model of the flow of information is schematically represented in Figure 5 below.

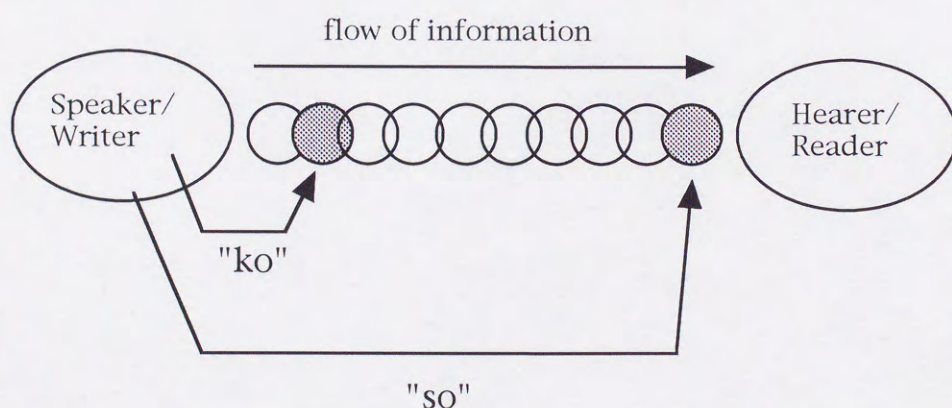


Figure 5. Anaphoric *ko* and *so*

Although the speaker/writer conveys information to the hearer/reader, the speaker/writer does not lose the information that (s)he conveys to the hearer/reader. Thus, the speaker/writer conveys not information but the "copy" of information to the hearer/reader. According to this idea, Figure 4

is revised as follows.

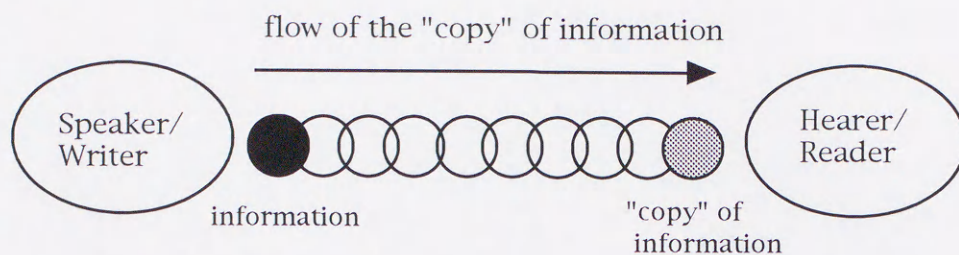


Figure 6. The flow of information (revised)

Figure 6 indicates that the speaker/writer and the hearer/reader shares information. In written text, the flow of the "copy" of information is an one-way process, from the writer to the reader. The writer always pays attention to the place of the "copy" of information, and uses anaphoric devices to refer not to the "origin" of information but to the "copy" of information. On the other hand, in conversation, the flow of information is a multi-way process; that is, the speaker and the hearer interchanges each other. If given information is the information that the speaker has presented, the speaker pays attention to the place of the "copy" of information, and uses anaphoric devices to refer to the "copy" of information. On the other hand, if given information is the information that another person has presented, the speaker pays attention to the place of the "origin" of information, and uses anaphoric devices to refer to the "origin" of information. We suggest the following principle.

(38) The principle of hearer-superiority:

When the speaker and the hearer share information, the speaker considers the information that hearer possesses as more important

than the information that the speaker possesses.

In conversation, the speaker always accesses to the file cards about the hearer(s) in his/her own episodic memory, and these file cards are active during the conversation. The speaker always pays attention to whether given information is shared by the hearer(s).

This accounts for the fact that *ko* cannot refer to the thing or person that another person have presented (the property of (iii)), and neither the speaker nor the hearer can use *ko* to refer to the thing or person that has been referred by *ko*. The principle of hearer-superiority induces the speaker to refer to the thing or person that has been presented by him/her or another person to use *so*. This is schematically represented in Figure 7 below. The figure presented above represents the case in which the speaker/reader refers to the thing or person that (s)he has presented, while the figure presented below represents the case in which the speaker refers to the thing that another person in the context has presented.

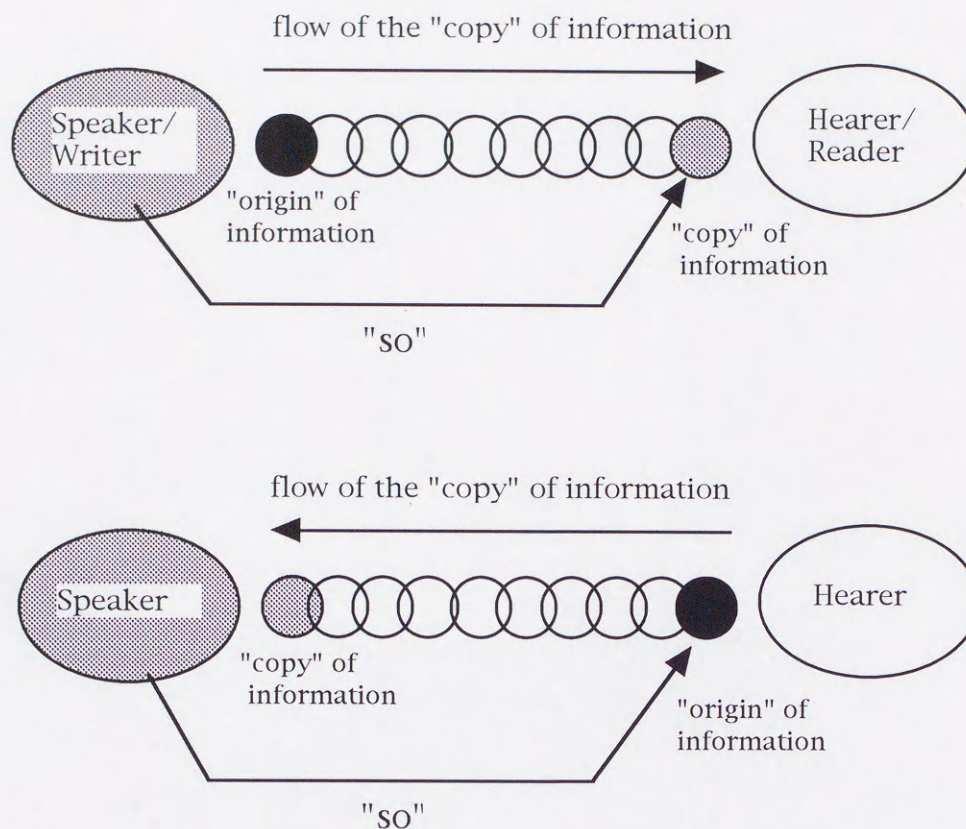


Figure 7. The importance of hearer's information

Ko and *so* is a working-memory-oriented anaphora, and the use of *ko* or *so* is independent on the episodic memory. This accounts for the fact that *ko* and *so* can refer to the person or thing that the speaker does not know, and that *so* can be bound to nonreferential nouns. It is a necessity condition to use *ko* or *so* that the entity exists in the working memory. As we will discuss in 4.3.2.2.2, *a* refers to the entity in the episodic memory. Because of the division of labor, *so* tends to refer to the thing or person that the speaker/writer does not know. However, it is not clear why *ko* cannot refer to nonreferential entity.

The metaphor of the flow of information is a metaphor of the speaker-hearer dimension (see Figure 3). This accounts for the fact that *a* cannot be used anaphorically.

4.3.2.2.2 The Metaphor of the Memory System

The "inside-outside" dimension (c.f. Figure 3) is mapped onto the model of human's memory system. The speaker-hearer's community is mapped onto the working memory, because the working memory is a "shallow" level to be accessed more easily. The "outside" of the speaker-hearer's community is mapped onto the episodic memory, because the episodic memory is a "deeper" level in which the speaker's experiences are stored. This mapping is schematically represented in Figure 8 below.

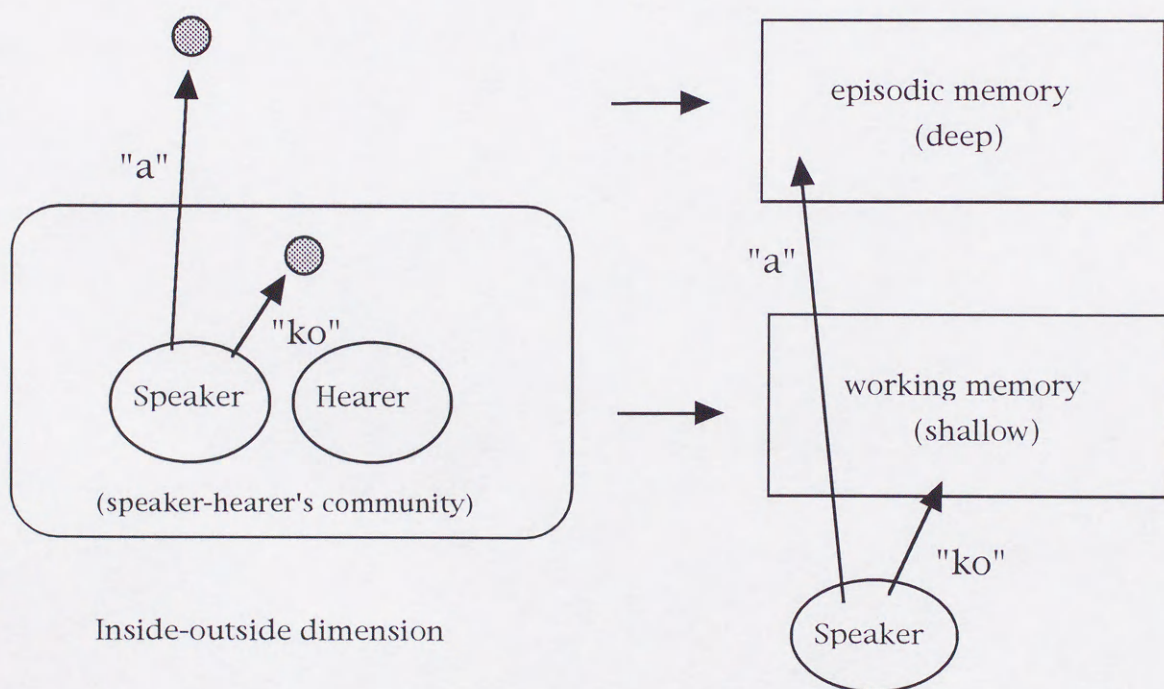


Figure 8. The metaphor to human's memory system

This account for the fact that *a* refers to the thing or person in the speaker/writer's memory. It is not a necessary condition that the hearer knows a thing or person to use *a*. As discussed in Chapter 2, we cannot directly access another person's memory system; thus, the speaker accesses

his/her own memory system, and calculates the mutual knowledge. In fact, *a* can be used at the beginning of text. The following example is one of the beginning of a nonfiction text.

- (39) めずらしく飲まずに帰ったあの日。いったん家族に顔を見せたうえで、洋服を着替え、手と顔を洗い、うがいをし、... おきまりの「儀式」をすますと、妻子の待つテーブルにつきました。

Mezurashiku nomazu ni kaetta *ano* hi. Ittan kazoku ni kao o miseta ue de, yoohuku o kigae, te to kao o arai, ugai o shi, okimari no "gishiki" o sumasu to, watashi wa saishi no matsu teeburu ni tsuki mashita.

'One day it was rare for me to come home without drunk. I changed my clothes, wished the hands and face, and gargled. After I finished my "ceremony", I sat at the table where my wife and children sat.'

(*Doji na teishu*, Hideo Akiyama)

A, as well as *kare* in 4.2, refers directly to the entity in the episodic memory, and indirectly refers to the entity in the working memory. However, there is a difference between *a* and *kare*. We assume that *a* can form a "vacuous entity" in the working memory, and refer indirectly to it, while *kare* cannot. This accounts for the fact that *a* can be used at the beginning of text, while *kare* cannot. Furthermore, this account for the following contrast.

- (40) a. 太郎_i は花子が彼_j を嫌っていると思っている。

Taro_i wa Hanako ga kare_j o kiratte iru to omotte iru.

'Taro thinks that Hanako dislikes him.'

- b. *太郎_i は花子があ_jの男_j を嫌っていると思っている。

*Taro_j wa Hanako ga ano otoko_j o kiratte iru to omotte iru.

'Tatr thinks that Hanako dislikes that man.'

In (40b), *ano otoko* 'that man' forms a vacuous entity in the working memory; thus, it cannot be coreferential with other entity that has been formed in the working memory, i.e., *Taro*. This process is schematically represented in Figure 9 below.

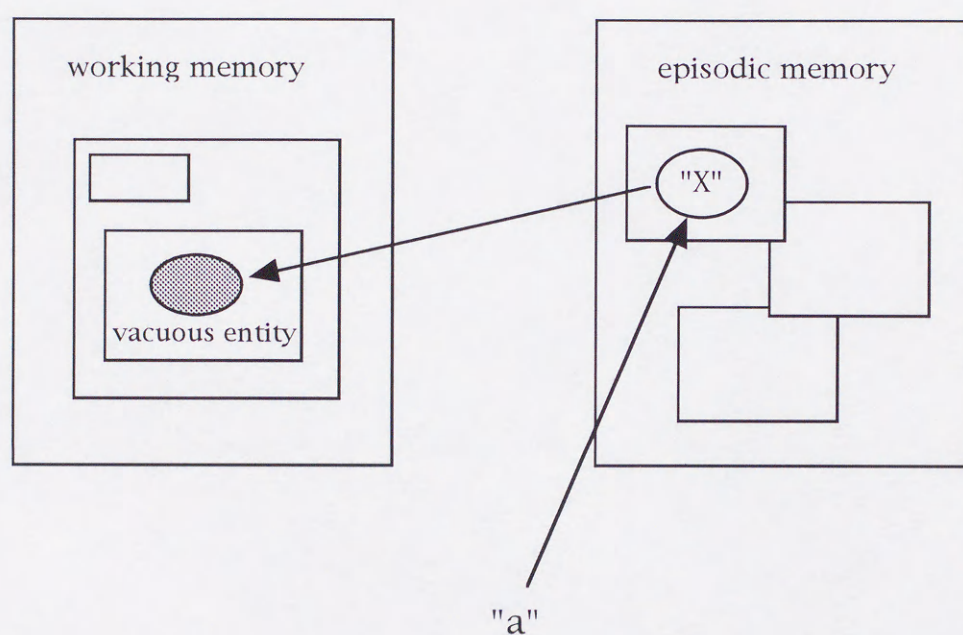


Figure 9. Formation of a vacuous entity

4.3.3 The Procedural Meaning of *Ko*, *So* and *A*

In this section, we have shown that the anaphoric use of *ko*, *so* and *a* is a metaphorical one of their direct-pointing use. Thus, we need not to distinguish two use of *ko*, *so* and *a*; and we need only to stipulate that *ko*, *so* and *a* has the following procedural meaning, respectively.

- (i) *Ko* refers to the entity that the speaker assumes to be close to him/her (and the hearer).

- (ii) So refers to the entity that the speaker assumes to be close to the hearer.
- (iii) A refers to the entity that the speaker assumes to be distant from both him/her and the hearer.

4.4 Bare Nouns

Japanese nouns can be used both to refer to noun phrases in the preceding discourse (i.e., an anaphoric use), and to be bound to nonreferential nouns (i.e., a nonreferential use).

- (41) 砂の上を歩くものがあった。... (中略) ... しかし、それが人間の女であるとわかるまでに、パットーはエア・ホースの高度を二分の一に下げなければならなかった。彼はエア・ホースを女の十メートル後方に下ろし、女を大音声で呼ばわったが、気づいたふうはまるでなかった。

Suna no ue o aruku mono ga atta.

(some sentences)

Shikasi, sore ga ningen no onna de aru to wakaru made ni, Patto wa eaa hoosu no koodo o nibun no ichi ni sagenakereba naranakatta. Kare wa eaa hoosu o *onna* no juu meetoru koofoo ni oroshi, *onna* o daionjoo de yobawatta ga, kizuita huu wa marude nakatta.

'There was something moving on the sands. ... However, Patoo lowered one second height of the air horse, and then he saw that to be a woman. He stopped the air horse 10 meters before her, and called her in a big voice, but she didn't notice him.'

(*Jigi Sutaas dasuto*, Ryo Mizumi)

- (42) 私のそれまでの女の扱いは、それほど身勝手なものではなかった。若い女とつきあうときは、わずかばかりの経済的援助をするだけで、自立した女とつきあうときは、いくらか高価なプレゼントをするという程度だった。

Watashi no sore made no onna no atsukai kata wa, sore hodo migatte na mono de wa nakatta. Wakai *onna* to tsukiau toki wa, wazuka bakari no keizaitekienjo o suru dake de, jiritsu shita *onna* to tsukiau toki wa, ikuraka kooka na purezento o suru toiu teedo datta.

'My treatment for a lady was not so selfish. When I fall in love with a young lady, I only do a little financial support. When I fall in love with an independent lady, I only give her a little expensive present.'

(*Chiizu ni au wain*, Kenzo Kitakata)

In (41), *onna* 'lady' is used to refer to the entity that appears in the preceding discourse, while in (42), *onna* 'lady' is used nonreferentially, i.e., a type or group representation. We call these nouns "bare nouns." In this section, we will see the dual uses of bare nouns.

4.4.1 The Anaphoric Use of Bare Nouns

All of bare nouns in Japanese cannot use anaphorically. The animate bare nouns can use anaphorically. In the following example, *inu* 'dog' is used to refer to *uchi no inu* 'my dog', which is introduced in the preceding discourse

- (43) 二階の書斎の窓を開けてヴェランダに出てみると、思った通り、猫にからかわれているうちの犬がいらだっているところである。... (中略) ... それで別に犬の鼻面でもひっかいたわけでもないらしいのでけれど、犬はあっさうい

らだって、吠えている。

Nikai no shosai no mado o akete veranda ni dete miru to, omotta toori, neko ni karakawarete uchi no inu ga iradatte iru tokoro de aru.

(some sentences)

Sorede betsu ni *inu* no hanazura demo hontoo ni hikkaita wake de mo nai rashii no da keredo, *inu* wa isso iradatte, hoete iru.

'As I opened the window of the study room on the second floor, and entered to the porch, a cat made fun of our dog, and the dog was nerves. ... Although a cat had not scratched the front of the dog's nose, the dog got more nerves, and was barking.'

(*Neko*, Daizaburo, Okumoto)

However, inanimate bare nouns are difficult to use anaphorically. The following example is an invented one.

(44) #机の上に読みかけの本がある。本は十年以上前に買ったものだ。

#Tsukue no ue ni yomikake no hon ga aru. *Hon* wa juunen ijo mae ni katta monoda.

'There is a book, which I am reading now, on the desk. I bought it more than 10 years ago.'

The anaphoric bare nouns can be replaced with *sono/kono* + nouns or *sore/kore*. In (43), *inu* can be replaced with *kono inu*, and in (44), if *hon* is replaced with *sono/kono hon* or *sore/kore*; it is felicitous.

The anaphoric use of bare nouns are limited to appear in written text, do not appear in conversation.

The observation presented above leads the following conclusion. A bare noun retrieves not a uniquely identifiable entity but a type or group

representation from the permanent semantic memory (i.e. the lexicon). Bare nouns have conceptual meaning. The type or group representation is linked to the entity in the working memory which is corresponded to the conceptual meaning of a bare noun. This process is schematically represented in Figure 10 below.

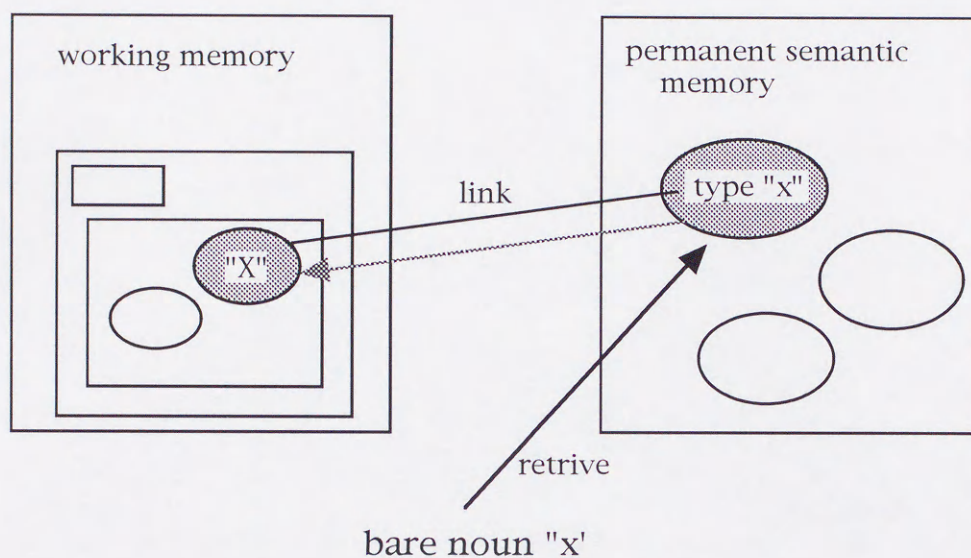


Figure10. Anaphoric bare nouns

As seen in 4.3, the entity in the working memory can be referred to by *so*. But *so* is not an independent lexical item; *so* is used only in joining with other lexical items. *Sore*, which is *so* + *re*, is difficult to use to refer to the nonanimate entity. Thus, the animate entity in the working memory is referred to by *sono* + nouns: e.g., *sono hito/otoko/onna/inu*. The human entity in the working memory can be referred to by *kare/kanojo*. As seen in 4.2, *kare/kanojo* retrieves a specified entity on a file card in the episodic memory. Thus, we must use the *sono* + noun form to refer to the human or animate entity that do not stored in the episodic memory. However, the

sono + noun form is "heavier" than a bare noun, because the *sono* + noun form is made up from three lexical items, while a bare noun is a single lexical item. This is why the animate entity in the working memory tends to be referred by a bare noun.

The reason why the anaphoric bare noun is used only in written text is not clear.

4.4.2 The Nonreferential Use of Bare Nouns

In Akizuki (1996) I observed that in Japanese written text, the nonreferential entity tends to be continued to be referred by bare nouns, not replaced with pro-forms. As seen in 4.3, *so* is difficult to use to refer to the nonreferential entity. However, *so* can refer to the both animate and inanimate, nonreferential entity (some native speaker of Japanese reject the use of *so* to refer to the human nonreferential entity). The example of (36) is repeated here as (45).

(45) 健康食品とは、その名のとおり食べると健康によいとされている食品である。

Kenkoo-shokuhin to wa, sono na no toori taberu to kenkoo ni yoi to sarete iru syokuhin de aru.

'Health food is considered to be good for health as shown in its name.'

(*Momo no kanzume*, Momoko Sakura)

(46) 人はその価値観にしばられている。

Hito wa so no kachikan ni shibararete iru. (invented example)

'Every human is bound to his sense of values.'

As seen in 4.4.1, *so* is not an independent item; thus, if we will use *so* as the

subject, object, and other major grammatical phrases, other lexical items must be attached to *so*; that is, we must use the *so* + noun form (e.g., *so no hito/koto*). The *sono* + noun form is "heavier" than a bare noun. This is why a bare noun is generally used to refer to the nonreferential entity.

4.5 Proper Nouns with *Toiu*

Proper nouns are stored in the episodic memory, but not in the permanent semantic memory. Proper nouns function as a "key" to retrieve an entity from the episodic memory. When the speaker/writer use a proper noun, (s)he access the episodic memory. This means that to know the name is to store it in the episodic memory. The content of the episodic memory varies from person to person. Thus, it usually happens that a proper noun is stored in someone's episodic memory, while it is not stored in another person's episodic memory. When the speaker/writer assumes that a given name is stored in the hearer/reader's episodic memory, the speaker/writer use a "bare" proper noun. On the other hand, when the speaker/writer assumes that a given name is not stored in the hearer/reader's episodic memory, the speaker/writer uses the form in which *to(ka)iu* or *nazo/naru* is attached to a proper noun.

(47) このところ「芳賀ゆい」という名のアイドルが世間を騒がせている。

Kono tokoro "Haga Yui" *toiu* na no aidoru ga seken o sawagasete iru.

'These days the idol named as *Yui Haga* caused a great sensation.'

(*Puro no junan no jidai*, Eijiro Morikawa)

(48) カーネル・サンダースの人形というのをご存じでしょうか。

Kaaneru Sandaasu no ningyoo *toiu* no o gozonji daroo ka.

'Do you know the stature of Kernel Sanders?'

(*Kaeneru Sandaasu to Ninomiya Kinjiro*, Shoichi Inoie)

(49) 先日、神社の夜店で、「鶏卵まんじゅう」なるものを売っていた。

Senjitsu, jinja no yomise de, "Keiran-Manju" *naru mono o utte ita.*

'Some day a night stall in a shrine sold "chicken-egg bun".'

(*Tamago no aji*, Kaoru Furukawa)

In the text of (48), *Kaeneru Sandaasu* is attached *toiu*, while *Ninomiya Kinjiro* is not. This is why the writer assumes that Japanese readers know *Ninomiya Kinjiro* (his statures stand in many elementary or junior high schools in Japan), but does not know *Kaeneru Sandaasu*.

4.6 Nouns with "Adjuncts"

Contrary to English, in Japanese, not only nouns but also proper nouns or "pronouns" can be preceded by phrasal element. The examples presented above as (16) and (17) are repeated here as (51) and (52).

(50) 一時間の残業を終えて会社を後にした彩子は、木枯らしの吹きすさぶ中、札幌 J R 駅前の通りへと出て、そのまま南へ向けて歩き出した。

Ichi jikan no zangyo o oete kaisha o ato ni shita Ayako wa,
kogarashi no hukisusabu naka, Sapporo JR eki mae no toori e to
dete, sono mama minami e mukete aruki dashita.

'As Ayako had done overtime work for an hour, she left the office. She went to the street in front of Sapporo station, and walked toward south, in storming violently.'

(*Yasashii kotoba*, Shizuko Todo)

(51) 日本における世界的巨匠として有名な彼のことだから、スケールの大きいシ

賞をうけたのは当然という評判だった。

Nihon ni okeru sekai-teki kyosho toshite yuume na *kare* no koto da kara, sukeeru no ookii shoo o uketa no wa toozen to iu hyooban datta.

'Since he is well-known as a world-wide great man of Japan, it is said that they takes for granted that he received the great prize.'

(*Yume no irodori*, Tomomi Muramatsu)

- (52) そんなことを身近に話す彼女を見ていると、彼女の意図を推しはかろうとあせっているいつものぼくの行動がまったくの徒労のように思えてくる。

Sonna koto o mujakini hanasu *kanojo* o mite iru to, *kanojo* no ito o oshihakaroo to asette iru itsumo no boku no koodoo ga mattaku no toroo no yooni omoete kuru.

'Looking at her, who told it innocently, I think it is no use that I always try to read her thought.'

(1966 *nen*, *fuyu*, *heart break hotel*, Takeshi Kamewada)

- (53) 礼美は、ふたたび冷ややかな目で、早坂を見ている自分を知り、急いで目の力を抜こうと試みる。

Reimi wa, *futatabi hiyayaka na me de*, *Hayasaka o mitr iru jibun* o shiri, isoide me no chikara o nukoo to kokoromiru.

'Reimi noticed that she also looked at Hayasaka with a cool look, and she tried to lose the power of her look quickly.'

(*Sora kara no tegami*, Shizuko Todo)

The clausal elements preceding a proper noun, *kare/kanojo* or *jibun* functions not as "restrictive" but as "appositive". We suggest that the "adjunct" preceding a noun represents the "background information". We will discuss the background information in chapter 5. Note here that the

addition of the background information is independent on the procedural meaning of referring expressions. Thus, the "adjunct" can be attached to various types of referring expressions.

4.7 *Jibun*

Jibun is not sensitive to the status of information. In other words, *jibun* has no procedural meaning of how to manage information. *Jibun* is sensitive to structural information in a sentence; i.e., the subject-orientation, logophoricity, awareness (see Kuno (1973, 1978)), or the distinction of public expression and private expression (see Hirose (1997)). Now, I have no idea to account for these properties in the model of information-processing presented above.

4.8 Japanese Anaphora System and Their Implications

In this chapter, we have seen that referring expressions in Japanese have the procedural meaning to access the information in the storages of memory. The referring expressions are divided with respect to which storage of memory it is specified to access.

(54) WM-oriented: \emptyset , *ko*, *so*

EM-oriented: *a*, *kare/kanojo*

PSM-oriented: bare nouns (e.g., *otoko*, *onna*)

Zero pronouns, *ko* and *so* are specified to access information in the working memory; *a* and *kare/kanojo* to access information in the episodic memory, bare nouns to access information in the permanent semantic memory. To use a referring expression, the entity to which it refers has presented in the discourse or context; i.e., it is present in the working memory. The WM-

oriented referring expressions are unmarked ones, in the sense that they directly refer to the entity, while the EM-oriented and PSM-oriented referring expressions are marked ones, in the sense that they indirectly refer to the entity via the episodic memory or permanent semantic memory. To use a referring expression and not to use another (if it can be used) raise implications. To use the WM-oriented referring expression implies that the speaker/writer assumes that the entity to which it refers is not stored in the hearer/reader's episodic memory. To use the WM-oriented referring expression gives the hearer/reader a signal not to access his/her episodic memory. On the other hand, to use the EM-oriented referring expressions gives the hearer/reader a signal to access his/her episodic memory. When the speaker/reader uses the EM-oriented referring expression, (s)he assumes that the entity to which it refers is stored in the hearer/reader's episodic memory; i.e., it is the thing or person that the hearer/reader has so far seen or heard about. To use the PSM-oriented referring expression is followed from the lack of the independent WM-oriented referring expressions to refer to human/animate entities. As discussed in Section 4.4, *so* and *ko* are dependent/bounded items; thus, we must use the *sono* + noun form to refer to the human/animate entity that do not stored in the episodic memory. However, the *sono* + noun form is "heavier" than a bare noun, because the *sono* + noun form is made up from three lexical items, while a bare noun is a single lexical item. Thus, the limited class of bare nouns (e.g., *otoko*, *onna*, *inu*) is used.

Chapter Five

"Free" Word-Order Phenomena in Japanese

5.0 Introduction

Human beings must arrange some pieces of information linearly to convey information by means of language. The information coming from the outside world or retrieved from one's own memory is not always arranged linearly. Even if a sequence of events occurs successively or some pieces of information is retrieved in order, we must re-arrange some pieces of information into a possible and felicitous linear sequence in a language. In the literature on syntax it has been discussed that the possible and felicitous linear sequence of pieces of information in a language is determined by some different levels of principles: grammatical (syntactic) principles, cognitive principles, pragmatic principles, and so on. They assume that the possible linear sequences in a language are determined by grammatical principles, and that cognitive or pragmatic principles "pick up" a felicitous linear sequence out of the grammatically-determined possible linear sequences. In Japanese, the grammatically-determined possible linear sequence must be "head-final". A verb is placed sentence-finally, a particle/postposition is suffixed with a noun, a subordinate clause precedes a main clause, and a modifier precedes a modifiee. In the following pair, (a) is grammatical (i.e., a

possible linear sequence), while (b) is ungrammatical.

- (1) a. 太郎がピザを食べた。
Taro ga pizza o tabeta.
'Taro ate a pizza.'
- b. *太郎が食べたピザを。
*Taro ga tabeta pizza o.
- (2) a. 太郎がピザを食べた。
Taro ga pizza o tabeta.
'Taro ate a pizza.'
- b. *が太郎をピザ食べた。
*Ga Taro o pizza tabeta.
- (3) a. 太郎が来たとき、花子は寝ていた。
Taro ga kita toki, Hanako wa nete ita.
'When Taro came, Hanako was sleeping.'
- b. *花子は寝ていた、太郎が来たとき。
*Hanako wa nete ita, Taro ga kita toki.
- (4) a. 太郎は花子を買ってきたピザを食べた。
Taro wa Hanako ga katte kita pizza o tabeta.
'Taro ate the pizza which Hanako bought.'
- b. *太郎はピザ花子を買ってきたを食べた。
*Taro wa pizza Hanka ga katte kita o tabeta.

The grammatical principles (e.g., the head-final constraint) determine the set of possible linear sequences. The set contains some linear grammatical sequences. The set of the proposition "Taro ate pizza" contains the following grammatical linear sequences.

- (5) a. 太郎がピザを食べた。
Taro ga piza o tabeta.
'Taro ate a pizza.'
- b. ピザを太郎が食べた。
Piza o Taro ga tabeta.
'The pizza, Taro ate.'
- c. ピザを食べたのは太郎だ。
Piza o tabeta no wa Taro da.
'It is Taro that ate a pizza.'
- d. 太郎が食べたのはピザだ。
Taro ga tabeta no wa piza da.
'It is a pizza that Taro ate.'

However, as we have presented in Chapter 1, we cannot distinguish linguistic information from extra-linguistic information. The head-final constraint is violated by some pragmatic factors (see Chapter 1). This means that we abandon the idea that grammatical principles first determine the possible set of orders and then pragmatic or cognitive principles "pick up" a felicitous order. We assume that various kinds of principles of order-arrangement are applied to disordered sequences simultaneously.

In our information-management model, the information coming from the outside world or retrieved from one's own memory is arranged linearly on a file card in working memory. The incoming information is divided into a cluster of information. A cluster of information corresponds to a phrase in a grammatical sense. A cluster of information is a minimal unit to be arranged linearly. As discussed in Chapter 2, the cognitive principles (e.g., saliency) distributes clusters of information into grammatical slots on a file card. The

clusters of information on a file card are not arranged linearly, because the linearity of clusters of information is irrelevant to the retrieval of information; thus, file cards stored in episodic memory contains no information as to the linearity. The order-arrangement principles arrange clusters of information in grammatical slots to a felicitous linear sequence.

Note that we assume that non-lexical elements (e.g., zero pronouns) are invisible to the order-arrangement principles. The order-arrangement principles only affect the 'visible' lexical elements.

In this chapter, we will propose some order-arrangement principles, and see how these principles are applied and interact with each other.

5.1 Given-First Principle

The order of clusters of information is sensitive to the information in the working memory at any given time. As discussed in Chapter 2, keeping a folder active is a default process. The speaker/writer tries to take advantage of the information in an active folder, and to connect it with the new information that (s)he is going to talk/write about. Thus, the speaker/writer tries to put the clusters of information in the working memory on the first position. We call this the "given-first principle".

On the way of discourse, the working memory contains a file card on which immediately previous information is entered. In general, the cluster of information on a file card in the working memory is represented by an anaphoric item: e.g., *ko* or *so*.

- (6) 美味しいものを食べにいこうと、女三人で、北の海へかけた。獲れたてのホタテ貝や、好物のウニ、イクラでお腹を満たし、上機嫌で旅の最終地S町に到着した。ここには、従妹が住んでいる。

Oishii mono o tabe ni ikoo to, onna san-nin de, kita no umi e dekaketa. Toretete no hotategai ya, koobutsu no uni, ikura de onaka o motashi, jookigen de tabi no saishuchi, S-machi ni toochaku shita. *Koko* ni wa, imooto ga sunde iru.

'We, three women, went to the north sea to have good tables. We had scallops which had just caught, and our favorite seasoned sea-urchin eggs or salmon roes, so that we had eaten our fill. And then we arrived at the final point of the trip, S city. My cousin lives there.'

(*Konbiniensu sutoa erejii*, Kumiko Koba)

- (7) いつだったか、洋服の好みかなにかのことで、男友達といい争いになったことがあった。その男は、わたしの服のセンスが悪い、と言うのである。

Itsu datta ka, yoohuku no konomi ka nanika no koto de, otoko-tomodachi to iiarasoi ni natta koto ga atta. *Sono otoko* wa, watashi no huku no sensu ga warui, to iu no de aru.

'One day I quarreled with a boy friend of mine about the taste of clothes. He said that I had no sense of clothes.'

(*Ichiman-nisen-nichi-me no yuuutsu*, Saeko Himuro)

In (6), *koko* 'this place' refers to *S-machi* in the previous sentence, and *koko* appears sentence-initially. In (7), *sono otoko* 'that man' refers to *otoko-tomodachi* 'boy friend' in the previous sentence, and *sono otoko* appears in sentence-initially. The following example is a case of conversation.

- (8) 「でもあたし、なにか失恋したような気持ちでもあるのよ。」

"Demo atashi, nandaka shitsuren shita yoona kimochi de mo aru no yo."

'But I feel like broken heart.'

「それはおれも同じだな。」

"Sore wa ore mo onaji da na.

'I feel like it, too.'

(*Watashi no daijina hito dakara*, Yoko Mori)

In (8), *sore* refers to the content of the first speaker's talk, and appears sentence-initially.

Japanese has a lot of sentence-connective items including *so* or *ko*: e.g., *soshite*, *sorede*, *sokode*, *soreni*, *sorenanoni*, *soredemo*, *korede*, *kooshite*, and so on. These items play the same role as sentence-initial anaphors.

- (9) 勿論、有難く頂戴した。これで、今夜の彼等は、コンビニエンス・ストアのお弁当から解放されるのだと、私達はいささかの功德を施したような気分を味わって、機上の人となった。

Mochiron, arigataku chodai shita. *Korede*, konya no karera wa, konbiniensu sutoa no obentoo kara kaihou sareru no da to, watashi-tachi wa isasaka no kudoku o hodokoshita yoona kibun o ajiwatte, kijoo no hito to natta.

'It was grateful for us to be given it. We have a feeling of doing some good deeds for them not to have packed lunch boxes of a convenience store, and we boarded an airplane.'

(*Konbiniensu sutoa erejii*, Kumiko Koba)

- (10) それが毎日、何の進歩もなく、屈辱を受けているのは見るに忍びない。それで、厳正中立を守ることができなくなって、ヴェランダの上から「しっ」と言ってみたのだが、猫はちらと、こちらを見るだけである。

Sore ga mainichi, nan no shinpo mo naku, kutsujoku o ukete iru no wa miru ni shinobi nai. *Sorede*, genseichuritsu o mamoru koto ga

dekinaku natte, veranda no uekara "Shit" to itte mita no da ga,
neko wa chira, to kochira o mirudake de aru.

'I could not bare to see the dog humiliated without no progress
everyday. So I could not maintain strict neutrality, and shouted,
"Shi". However, the cat only glanced at me.'

(*Neko*, Daizaburoo Okumoto)

The "given" information is not always represented by anaphoric items. In
the following example, the sentence-initial phrase represents the "inferable"
information from the previous information.

(11) 魚は全滅していた。おびただしい量の死体を母はサボテンの植木鉢の中に入
れていた。

Sakana wa zenmetsu shite ita. *Obitadashii ryo no shitai* o haha wa
saboten no uekibachi no naka ni irete ita.

'All of the fishes died. My mother was putting a great deal of fish
carcasses into the flower pots.'

(*Tai no okashira*, Momoko Sakura)

In (11), the sentence-initial phrase of *obitadashii ryo no shitai* 'a great
number of fish carcasses' is inferable from the previous sentence of *sakana
wa zenmetsu shite ita* 'all of the fishes died'.

As discussed in Chapter 2, at the beginning of conversation, the speaker and
the hearer share the folder named as "here-and-now" in their own working
memories. Thus, the speaker tries to start conversation to use the
information in the folder of "here-and-now" in his/her working memory.

(12) 「ここのブイヤベースが最高の味になる季節がやってきたな...

寺岡は、あらかじめ抜いておいたワインの名を告げに来たマスターに、舌な
めずりをするような顔を向けた。

"*Koko no buiyabeesu ga saikoo no aji ni naru kisetsu ga yatte kita na....*"

Teraoka wa, arakajime nuite oita wain no na o tsuge ni kita masutaa ni, shita-namezuri o suru yoona kao o muketa.

"A season has come when this Vienna base is the best." Teraoka turned his face to the master, who came to tell him the name of the wine which had been pulled.'

(*Orientalu gureen*, Tomomi Muramatsu)

(13) あの時最初に声を掛けてきたのは倉沢だった。

「それは加賀小紋ですね」

Ano toki saisho ni koe o kakete kita no wa Kurasawa datta.

"Sore wa Kagakomon desune."

At that time, it is Kurasawa who asked me first.

"Is it Kagakomon?"

(*Yukionna*, Kei Yuikawa)

In (12), *koko* 'this place' refers to the place where the speaker and the hearer exist, and appears sentence-initially. In (13), *sore* 'that' refers to the dress that the hearer wears, and appears sentence-initially.

The given-first principle exhibits the "pide-piping" effect. The more larger clause that contains the "given" information is put on the sentence-initial position.

(9) 「森は海の恋人」だ。それを題名にした本を畠山さんは書き、各地の小学生に講演したり、養殖場で体験授業をさせたりしている。

"Mori wa umi no koibito" da. *Sore o daimei ni shita hon o*

Hatakeyama san wa kaki, kakuchi no shogakkusei ni kooen shi tari, yoshokujo de taiken-jugyo o sase tari shite iru.

"The forest is a lover of the sea". Mr. Hatakeyama wrote a book whose title is taken from it, gives a lecture at local elementary schools, and lets them have an experience at his farm.'

(*Tenseijingo*, 1995.6)

In (14), *sore* 'it' refers to the quoted clause in the previous sentence. The minimal cluster of information is *sore o*, but the more larger cluster of information, *sore o daimei ni sita hon* 'a book whose title is taken from it', is put on the sentence-initial position.

The given-first principle and given information are defined as follows.

(15) Given-First Principle:

Put the given-information cluster first.

(16) Given Information:

The information in the active folder in the working memory, or the information inferable from it.

5.2 From-Background-to-Foreground Principle

Conveying new/unknown information is introducing a new world. As discussed in Chapter 2, creating a world is just alike drawing a picture. When we draw a picture, we can begin to draw from either the foreground/figure or its background. We assume that drawing from the foreground to its background is a default describing way. The speaker/reader tends to describe the world unknown to the hearer/reader in the way of zooming up from the background to the foreground. The speaker/reader arranges cluster of information in order from the background information to the foreground information. We call this the "from-background-to-foreground principle.

The background information is represented by various sorts of clusters of information. In a "simple" sentence, locative phrases, time adverbs, or "scene-setters" represent the background information.

- (17) 庭で犬が吠えている。

Niwa de inu ga hoete iru.

'The dog is barking in the yard.'

(*Neko, Okumoto Daizaburo*)

- (18) 冷蔵庫のフリーザー (冷凍庫) には、実にさまざまな食品が詰まっているもの
のだ。

Reizooko no furiizaa (reitooko) ni wa, jitsu ni samazama na shokuhin ga tsumatte iru mono da.

'There are various kinds of food in the freezer compartment of a refrigerator.'

(*Haha no kiku, Ryuichiro Utsumi*)

- (19) 三年前、友人が「やきいもジュース」という缶ジュースを買ったという話を
聞いた。

Sannen mae, yuujin ga "Yakiimo juusu" toiu kan-juusu o katta toiu hanashi o kiita.

'Three years ago, I heard that a friend of mine had bought a can of juice named as "Baked potato juice"

(*Momo no kanzume, Momoko Sakura*)

- (20) 島に住む動物と大陸に住む動物とでは、体の大きさが違う。

Shima ni sumu doobutsu to tairiku ni sumu doobutsu to de wa, karada no ookisa ga chigau.

'The size of body is different between animals living in an island

and ones living in a continent'

(*Shima no hoosoku*, Tatsuo Motokawa)

In (17) and (18), the locative phrases appears sentence-initially. The example of (18) is called the "locative inversion" in the literature on grammar or syntax. In (19), the time adverb appears sentence-initially. In (20), the sentence-initial phrase represents the basis for a comparison.

In general, subordinate clauses represent the background information in the "complex" sentence.

(21) 姉が21だか22の頃、母はよく見合い話をもってきていた。

Ane ga 21 daka 22 no koro, haha wa yoku miai-banashi o motte kite ita.

'When my sister is 21 or 22, my mother often brought her some formal meetings with a view to marriage.'

(*Saru no koshikake*, Momoko Sakura)

(22) 注文したドライ・シェリーをテーブルに置きながら、マスターは首をかしげてみせた。

Chuumon shita dorai sherii o teeburu e oki nagara, masutaa wa kubi o kasigete miseta.

'Putting the dry sherry I ordered on the table, the master leaned his head.'

(*Orientalu guriin*, Tomomi Muramastu)

In Japanese, the head-final constraint puts the subordinate clause before the main clause (see the example of (3)). Thus, in the "complex" sentence, the from-background-to-foreground principle is vacuously satisfied, as long as we assume that the pragmatic or cognitive principles pick up a felicitous sentence out of the set of grammatical sentences. Because of the head-final

constraint, in Japanese, the "appositive" clauses precede nouns (see Chapter 4). The appositive clauses represents the background information.

(23) ケースを交互に見わたしている綾子に、多田さんがさりげなくすすめてきた。

Keesu o koogo ni miwatashite iru Ayako ni, Tada san ga sarigenaku susumete kita.

'When Ayako looked at each cases by turns, Mr. Tada casually recommended.'

(Yasashii kotoba, Shizuko Todo)

In (23), the phrase containing the appositive clause appear sentence-initially.

The from-background-to-foreground principle is applied not only to a unit of a clause or sentence but also a unit of discourse.

(24) 未希子と二人で乗ったフェリーボートが港に着いた時、もう春だというのに雪が降っていた。それでもカモメ達が海面すれすれを飛んでいた。免許を取ったばかりのぼくは、凍った道をうまく運転できるかどうか、心配していた。

Mikiko to futari de notta feriibooto ga minato ni tsuita toki, moo haru da to iu noni yuki ga hutte ita. Sore de mo kamome-tachi ga kaimen suresure o tonde ita. Menkyo o tatta bakari no boku wa, koota mishi o umaku unten dekiru kadooka, shinpai shite ita.

'When Mikiko and I arrived at the port by ferry, it was snowing in spring. Sea mews were flying just over the sea. I had just obtained a driver's license, so I was worried that I could drive on the frozen road.'

(*Supika to tsuki*, Kenichi Yamakawa)

In (24), the sentences in italics represent the background information, which precedes the sentence that represents foreground information.

All of the examples showed above are in written text, and appear at the beginning or turning point in the texts. As discussed in Chapter 2, in written text, the writer and the reader do not share the same time and location. Thus, the writer needs to create the context or world that (s)he and the reader share, before the characters are introduced. On the other hand, in conversation, the speaker and the hearer share the same time and location, so they form the "here-and-now" folder in the working memories. Thus, the speaker can introduce the topic related to an entity in the "here-and-now" folder. In this case, the from-background-to-foreground principle is vacuously satisfied, because the background has been set.

The from-background-to-foreground principle is defined as follows.

(25) From-Background-to-Foreground Principle:

Arrange information in order from background to foreground.

5.3 Salient-Order Arrangement Principle

As discussed in Chapter 2, how to divide information into some clusters of information depends on the cognitive properties of entities. The most salient entity is selected as the subject, and the second salient entity is selected as the object. The saliency is a collection of the cognitive properties (see Chapter 2). The speaker/writer tends to arrange the most salient cluster of information first, the second salient cluster of information second, and the third salient cluster of information third. We call this the "salient-order arrangement principle". We assume that the salient-order arrangement

principle is a default principle; i.e., if no pragmatic or cognitive arrangement principles are applied, the salient-order arrangement principle is applied by default.

The default salient-order sentence appears when the speaker/writer tries to describe an event or state straightforwardly without special intentions.

- (26) さわやかな風が広場を吹きすぎてゆくと、花の甘い香りが濃密に漂ってきた。子どもたちが広場に走り出してきた。

Sawayaka na kaze ga hiroba o fukisugite yuku to, hana no amai kaori ga noomitsu ni tadayotte kita. Kodomo-tachi ga hiroba ni hashiri dete kita.

'A refreshing wind was blowing through the square, and sweet perfume of blossoms was in the air. Children ran into the square.'

(*Nichibotsu mae ni hasshin seyo*, Ryu Mitsuse)

(26) is an example of a nonfiction text. The sequence of events is described from the point of view of a character in the text. The default salient-order sentence often appears at the beginning or turning point of written text, because the default salient-order sentence is used to describe the background information. This accounts for the fact that the subordinate or embedded clause generally has the default salient-order.

In conversation, the default salient-order sentence is used when the speaker tries to describe an event or state in his/her presence straightforwardly.

The following example is a part of the play-by-play broadcasting of a match of judo.

- (27) 「おおっ！！ 猪熊、本阿弥を跳ね上げる！！ しかし本阿弥すかさず猪熊の腕を取りに行く！！ うわああ、本阿弥、強引にひっくり返す！！」

"Oh!! Inokuma, Honami o haneageru!! Shikasi Honami sukasazu

Inokuma no ude o tori ni iku!! Uwaa, Honami, gooin ni hikkurikaesu!!"

"Oh!! Inokuma lifts up Honami!! But Honami tries to get Inokuma's arm quickly!! Aaaa. Honami overturns Inokuma forcibly."

(YAWARA!, Naoki Urasawa)

In the studies of Japanese grammar, the order of the *ni*-phrase and *o*-phrase has been controversial. Sugimoto (1986) suggests that there are two types of the order: the *ni-o* type and the *o-ni* type. He observes that the *ni*-phrase in the *ni-o* type exhibits the grammatical properties of the indirect object, while the *ni*-phrase in the *o-ni* type does not. He concludes that the *ni*-phrase in the *ni-o* type is an indirect object, while the *ni*-phrase in *o-ni* type is a goal/target phrase. In the following examples, (28) is the *ni-o* type; (29) is the *o-ni* type.

(28) a. 先生は生徒に地図を見せた。

Sensei wa seito *ni* chizu *o* miseta.

'The teacher showed a map to the students.'

b. 群衆は罪人に罵声を浴びせた。

Gunshu wa zainin *ni* basei *o* abiseta.

'The crowd booed the criminal'

(29) a. 教授はその資料を都市史の研究に役立てた。

Kyooju wa sono shiryō *o* toshi-shi no kenkyū *ni* yaku dateta.

'The professor made use of the data for the study of the history of a city.'

b. 花子はバッジを太郎の胸につけた。

Hanako wa bajji *o* Taro no mune *ni* tsuketa.

'Hanako put a badge on Taro's breast.'

In the *ni-o* type, the *ni*-phrase is generally an animate entity, while the *o*-phrase is not. This means that in the *ni-o* type, the *ni*-phrase is more salient than the *o*-phrase. Thus, if no other pragmatic or cognitive arrangement principles are applied, the salient-order arrangement principle are applied (by default), and the *ni*-phrase precedes the *o*-phrase. On the other hand, the *o-ni* type, the *o*-phrase is generally a movable entity, while the *ni*-phrase is a stable entity (e.g. a location of goal). This means that in the *o-ni* type, the *o*-phrase is more salient than the *ni*-phrase. Thus, if no other pragmatic or cognitive arrangement principles are applied, the salient-order arrangement principle are applied (by default), and the *o*-phrase precedes the *ni*-phrase.

The salient-order arrangement principle is defined as follows.

(30) Salient-Order Arrangement Principle (default):

Arrange information in order from the most salient to least salient.

The default application of the salient-order arrangement principle means that the salient-order is a pragmatically and cognitively neutral one; i.e, a "basic word-order".

5.4 Focus-Marking Principle

The speaker/writer tries to draw the attention of the hearer/reader to a particular cluster of information in a sentence. Let us call it "focus". In conversation, the stress or intonational prominence is placed on the focus. In written text, the focus is sometimes marked by dots on a word, or replaced by *katakana* letters.

(31) 私は早速それをつがいで購入し、家に持って帰った。

Watashi wa sassoku sore o *tugai* de koonyuushi, ie ni motte kaetta.

'I bought a pair of them, and brought them to my house.'

(*Saruno kosikake*, Momoko Sakura)

(32) その某女性雑誌というのは、“女性〇〇”という、ズバリ女性器の隠語とも
思える語句のタイトルをつけている、アノ雑誌である。

Sono bojoseizassi toiu no wa, "Josei-XX" toiu, zubari joseiki no ingo
to mo omoeru taitoru o tukete iru, *ano* zasshi de aru.

'It is that magazine whose title makes us think of a slung of the
female sexual organs, "Women-Self".'

(*Momo no kanzume*, Momoko Sakura)

As shown in (31) and (32), the focused information tends to appear in the (immediately) preverbal position. In conversation, the speaker generally places the intonational prominence on the preverbal position, and in written text, if there are no special rhetorical tags (e.g. dots) in the text, the reader takes the cluster of information in the preverbal position as a focus. The pseudo-clefting is a syntactically-forced way to place the focused information in the preverbal position.

(33) a. 太郎が食べたのはピザだ。

Taro ga tabe ta no wa *piza* da.

'It is a pizza that Taro ate.'

b. ピザを食べたのは太郎だ。

Piza o tabe ta no wa *Taro* da.

'It is Taro that ate a pizza.'

The discussion above shows that in Japanese, the preverbal position is an

unmarked focus position. We propose the following principle.

(34) Focus-Marking Principle:

Mark the focused information by special tags, and/or place it to the immediately preverbal position.

The focus-marked information is interpreted in the phonological component (PF) by the following rule.

(35) Intonational Prominence Assignment Rule:

Put the intonational prominence

(i) on the tag-marked information; otherwise,

(ii) on the information in the immediately preverbal position, if there is no tag-marked information.

(34) and (35) work independently in the different modules. The focus-marking is speaker/writer-oriented. If the speaker/writer has no intention to draw the attention of the hearer/reader to a particular cluster of information in a sentence, the sentence contains no foci. On the other hand, every sentence has an intonational prominence. (35) guarantees that if there is no tag, the intonational prominence is assigned to the preverbal position by default.

Note that the notion of focus we use here is different from the notion of "new", "unknown", or "unpredictable". The notion of focus we use here depends on the speaker's intention. Which cluster of information the speaker/writer intends to draw the attention of the hearer/reader is independent on the status of a cluster of information. As long as the speaker/hearer's goal is to convey "new" information to the hearer/reader, it is not seldom that the focused information corresponds to the "new" information. However, this does not mean that the speaker/reader cannot

focus on the "old" information. Observe the following examples.

- (36) 最近はこのテの銭湯が増えてきているらしいが、クラシックな銭湯だけにしか出逢ったことのなかった私は、内心の動揺を匿すために、思わず、「このアカすり下さい」と言ってしまう、用もないのにアカすりを片手に、ツウぶった足どりで脱衣所に向かうのであった。

Saikin wa kono te no sentoo ga furte kite iru rashii ga , kurashikku na sentoo dake ni shika deatta koto no nakatta watashi wa, naishin no dooyoo o kakusu tameni, omowazu, "Kono akasuri kudasai" to itte shimai, yoo mo nai no ni akasuri o katate ni, tsuu butta ashidori de datsuijo ni mukau no de atta.

'It seems that this type of public-bathes are increasing recently. However, I have ever been to old type of public-bathes, and to hide my anxiety I said, "Give me this sponge". And then, I entered into the changing room having the sponge in his hand, although I don't need the sponge.

(*Momo no kanzume*, Momoko Sakura)

- (37) 太郎が食べたのはそれだ。

Taro ga tabeta no wa sore da.

'What Taro ate is that.'

In (35), *akasuri* 'sponge' is focused, although it represents "old" information, because it appears in the preceding sentence. (37) shows that *sore* 'it' can appear in the preverbal position of the pseudo-cleft sentence.

5.5 The Applications and Interactions of the Arrangement

Principles

We have suggested four cognitive or pragmatic arrangement principles. Let us repeat them below.

(15) Given-First Principle:

Put the given-information cluster first.

(25) From-Background-to-Foreground Principle:

Arrange information in order from background to foreground.

(30) Salient-Order Arrangement Principle (default):

Arrange information in order from the most salient to least salient.

(34) Focus-Marking Principle:

Mark the focused information by special tags, and/or place it in the immediately preverbal position.

The given-first principle is sensitive to the status of information in the working memory. The from-background-to-foreground principle depends on the speaker's assumption on the types of information. The focus-marking principle depends on the speaker's intention. These principles are applied independently, but interact with each other. In this section, we will see how these principles are applied to clusters of information, and interact with each other.

5.5.1 The Default Application of Salient-Order Arrangement Principle

As discussed in section 5.3, the salient-order arrangement principle is applied, only when other cognitive or pragmatic arrangement principles are not applied. In other words, the salient-order arrangement is applied when the speaker/writer tries to describe an event or state straightforwardly without special intentions. As discussed in section 5.3, however, the from-

background-to-foreground principle is a multilevel principle. Thus, it is possible that the from-background-to-foreground principle is applied to a discourse level, and the salient-order arrangement principle is applied to each sentence in the discourse, simultaneously. The example presented above as (24) is just the case, repeated here as (38).

- (38) 未希子と二人で乗ったフェリーボートが港に着いた時、もう春だというのに雪が降っていた。それでもカモメ達が海面すれすれを飛んでいた。免許を取ったばかりのぼくは、凍った道をうまく運転できるかどうか、心配していた。

Mikiko to futari de notta feriibooto ga minato ni tsuita toki, moo haru da to iu noni yuki ga hutte ita. Sore de mo kamome-tachi ga kaimen suresure o tonde ita. Menkyo o tatta bakari no boku wa, koota mishi o umaku unten dekiru kadooka, shinpai shite ita.

'When Mikiko and I arrived at the port by ferry, it was snowing in spring. Sea mews were flying just over the sea. I had just obtained a driver's license, so I was worried that I could drive on the frozen road.'

(Supika to tsuki, Kenichi Yamakawa)

5.5.2 The Interaction of Given-First Principle and From-Background-to-Foreground Principle

If the speaker/writer applies the given-first principle and from-background-to-foreground principle simultaneously, the sentence-initial element represents the given and background information. The example presented above as (6) is just the case, repeated here as (39).

- (39) 美味しいものを食べにいこうと、女三人で、北の海へかけた。獲れたてのホタテ貝や、好物のウニ、イクラでお腹を満たし、上機嫌で旅の最終地S町に到着した。ここには、従妹が住んでいる。

Oishii mono o tabe ni ikoo to, onna san-nin de, kita no umi e dekaketa. Toretete no hotategai ya, koobutsu no uni, ikura de onaka o motashi, jookigen de tabi no saishuchi, S-machi ni toochaku shita. *Koko ni wa, imooto ga sunde iru.*

'We, three women, went to the north sea to have good tables. We had scallops which had just caught, and our favorite seasoned sea-urchin eggs or salmon roes, so that we had eaten our fill. And then we arrived at the final point of the trip, S city. My cousin lives there.'

(*Konbiniensu sutoa erejii*, Kumiko Koba)

- (40) お世辞にも上手い絵だとは言えないが、俳画らしい味が出ていると満足した。その絵に俳句を入れてほしいと、東京在住の俳人、下川紀水さんにお願いをした。

Oseji ni mo umai e da to wa ienai ga, haiga rashii aji ga dete ite manzoku shita. *Sono e ni* haiku o irete hoshii to, Tokyo-zaijuu no haijin Shimokawa Kisui san ni onegai o shita.

'Although I can't say that the picture is good, I was satisfied with it because it crates a higa-like atmosphere. I asked Mr. Kisui Shimokawa, who lives in Tokyo, to write haiku on the picture.'

(*Takenoko*, Hiroko Tanaka)

Koko 'this place' in (39) and *sono e* 'that picture' in (40) represent given and

background information. The conspiracy of the given-first principle and from-background-to-foreground principle rises discourse-juncture effects. The sentence-initial phrase plays the roles to keep the background information active, and to introduce new entities in the active background.

5.5.3 The Vacuous Application of Focus-Marking Principle

The focus-marking principle is applied in connection with the given-first principle and the from-background-to-foreground principle. However, in most cases, the simultaneous application of focus-marking principle is vacuous. The given-first principle places given information sentence-initially, and "non-given" information backward. If the speaker/writer picks up the "non-given" information as a focus by placing it in the preverbal position, it has been placed in that position by the given-first principle. The following example is just the case.

- (41) とにかく室内にタンスがあることが大事なのである。それを夫はぜんぜんわ
かってない。

Tonikaku shitsunai ni tansu ga aru toiu koto ga daiji na no de aru.

Sore o otto wa zenzen wakatte nai.

'It is important that there is a chest in the room. My husband does not understand it.'

(*Tai no okashira*, Momoko Sakura)

In (41), the given-first principle places *sore* 'it' in the sentence-initial position, and the focus-marking principle (vacuously) places *otto* 'husband' in the preverbal position. *Sore* refers to the entity in the activated folder (see Chapter 4), and the phrase of *otto wa* reactivates the deactivated folder in the working memory (see Chapter 3). In this sentence, the writer intends

to draw the attention of the reader to the name of the deactivated folder.

The from-background-to-foreground principle places the foreground information backward. If the speaker/writer intends to draw the attention of the hearer/reader to the foreground information, the focus-marking principle is applied vacuously. The example showed as (20) is just the case, repeated here as (42).

(42) 島に住む動物と大陸に住む動物とでは、体の大きさが違う。

Shima ni sumu doobutsu to tairiku ni sumu doobutsu to de wa,
karada no ookisa ga chigau.

'The size of body is different between animals living in an island and ones living in a continent'

(*Shima no hoosoku*, Tatsuo Motokawa)

5.6 Arrangement Principles and Information-Sequences

The cognitive or pragmatic arrangement principles arrange clusters of information on a file card in the working memory. The clusters of information on a file card connect with the forward and backward clusters of information, and form the sequence of information. The sequence of information is divided into the following three types.

- (i) Folder-keeping sequence
- (ii) Folder-renewing sequence
- (iii) Background-describing sequence

The application of the cognitive or pragmatic arrangement principles are sensitive to which type of the information-sequence the speaker/writer selects. In this section, we will discuss how the cognitive or pragmatic arrangement principles interact with types of the information-sequences.

5.6.1 Folder-Keeping Sequence

When the speaker/writer intends to keep the activated folder active, and to enter the incoming information on the file cards in the folder successively, the folder-keeping sequence of information is formed. This process is schematically represented in Figure 1 below.

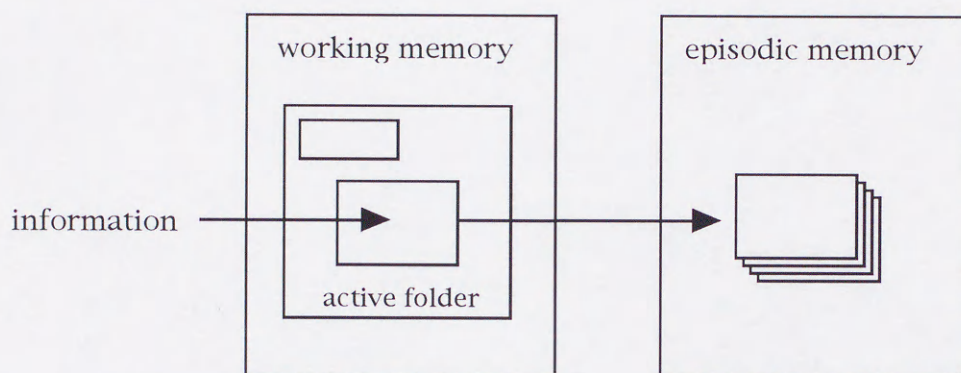


Figure 1. State of Memory in Folder-Keeping Sequence

The folder-keeping sequence is divided into two subtypes: (i) action sequence, and (ii) topic-comment sequence. In the action sequence, the name of the activated folder is an actor/actress, and his/her successive actions are described time-by-time. In the topic-comment sequence, the name of the activated folder is a "topic" that the speaker/writer selects, and the "comments" on the "topic" are added in order. In the following examples, (43) is the case of the action sequence, and (44) is the case of the topic-comment sequence.

- (43) シャワーを浴び終わり、バス・ルームを出ようとした時、タイミングよく電話のベルが鳴りだした。泰彦はバスタオルを腰に巻きつけただけの格好で、大股に部屋を横切ると、受話器を掴んだ。

Shawaa o abi owari, basu ruumu o deyoo to shita toki, taimingu yoku denwa no beru ga naridashi ta. *Yasuhiko* wa basutaoru o koshi ni makitsuketa dake no kakkoo de, oomata ni haya o yokogiru to, juwaki o tsukanda.

'When he took a shower and went out of the bath, the telephone has just begun to rung. *Yashuhiko* wore the bath towel around the waist, and crossed the room with long strides, and picked up the telephone receiver.'

(1966 *nen fuyu, haato bureiku hoteru*, Takeshi Kamewada)

- (44) 夫は、どうしようもないくらいビートルズが好きだ。とにかく、「ビートルズ」と書いてあるものすべてにときめきながら生きている。ビートルズのだれかがボソッとつぶやいたことまでよく記憶している。

Otto wa, dooshiyoo mo nai kurai Beetoruzu ga sukida. Tonikaku, "Beetoruzu" to kaite aru mono subete ni tokimeki nagara ikite iru. Beetoruzu no dareka ga boso tto tsubuyaita kotoba made yoku kioku shite iru.

'My husband likes Beatles very much. Everything about Beatles makes him happy. He remember what someone of Beatles muttered.'

(*Saru no koshikake*, Momoko Sakura)

In (43), the action of the actor *Yasuhiko* is described successively, and in (44), the comments on the topic *otto* 'husband' is added in order. In both of the cases, after the name of the folder is determined, it continues to be referred by zero pronouns (see Chapter 4). However, the active folder decays for a long time, because keeping a folder active spends processing resources (see Chapter 2). The speaker/writer sometimes reactivates the

decaying folder. As discussed in Chapter 3, the particle *wa* functions as the cue of reactivating the decaying folder. We assume that the cue of reactivation of the deactivated folder can be given at any time. This means that the *wa*-phrase can be placed in any position in a sentence as long as the cognitive or pragmatic arrangement principles are met.

In the folder-keeping sequence, the salient-order arrangement principle is applied, as long as the speaker/writer has no intention to draw the attention of the hearer/reader to a particular entity. In the action sequence, the speaker/writer generally tries to describe a sequence of events straightforwardly, and in the topic-comment sequence, the speaker/writer generally tries to comment on a particular topic objectively.

5.6.2 Folder-Renewing Sequence

When the speaker/writer picks up an entity in the active folder, and forms a new folder of the entity's name in the working memory, the folder-renewing sequence of information is formed. This process is schematically represented in Figure 2 below.

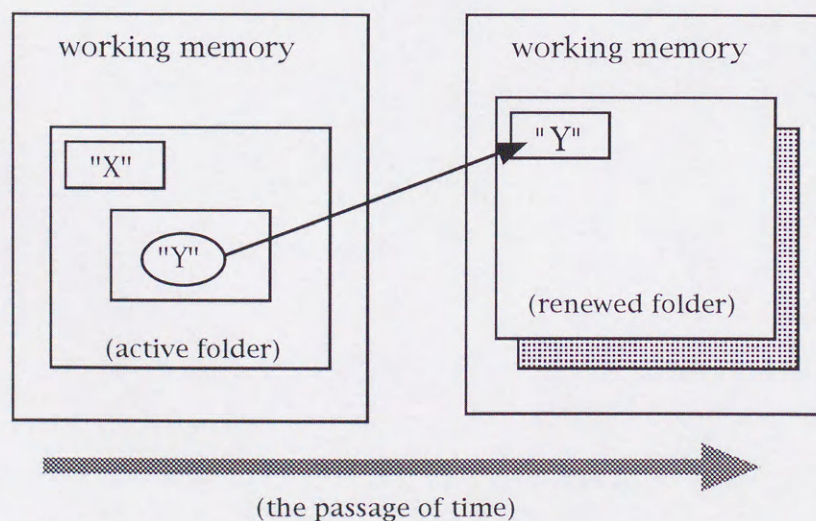


Figure 2. State of Memory in Folder-Renewing Sequence

The folder-renewing sequence often appears at the "turning point" in the discourse. At the turning point, the given-first principle is applied. The sentence to which the given-first principle is applied plays the role of introducing a new topic and connecting it to the entity in the active folder. The example of (45) is just the case.

(45) イスタンブールの友人宅に来る家政婦のおばさんの娘は、コーヒー占いの名人だ。名人と言ってもプロの占い師ではない。中学校に通う、十四歳の少女である。

おばさんは黒海地方の村の出で、訛りが抜けきらないトルコ語でよく喋った。

Isutanbuuru no yuujin-taku ni kuru kaseifu no obasan no musume wa, koohii-uranai no meijin da. Meijin to itte mo puro no uranai-shi de wa nai. Chuugakkoo ni kayou, 14 sai no shoojo de aru. Obasan wa kokkai-choho no mura no de de, namari ga nukekirai Toruko-go de yoku shabetta.

'The daughter of the housewife who comes to my friend's house in Istanbul is good at coffee-fortune-telling. However, she is not a professional fortune-teller. She is 14 years old, and a junior high school student. The housewife was born in a village in Black Sea, and used to speak dialect Turkish.'

(*Koohii-uranai*, Etsuko Shindo)

In (45), the writer first forms a folder named as the daughter. However, in the second paragraph, the writer picks up an entity (*obasan* 'housewife') in the immediately previous sentence, and locates it as the name of the

renewed folder.

5.6.3 Background-Describing Sequence

When the speaker/writer has no intention to pick up a particular entity in the working memory as a topic, and intends to describe the world objectively, the background-describing sequence of information is formed. We assume that in this case, the folder named as "background" is formed in the working memory. As discussed in Chapter 2, a file card is not stored into the episodic memory until describing the background is completed. Thus, in the background-describing sequence, the background information is successively stored in the working memory. This process is schematically represented in Figure 3 below.

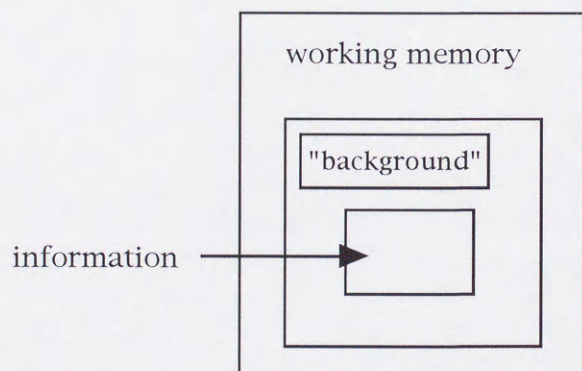


Figure 3. State of Memory in Background-Describing Sequence

The saliency-order arrangement principle is applied to the sentences in the background-describing sequence, as long as the speaker/writer has no intention to draw the attention of the hearer/reader to a particular entity. The background-to-foreground principle is applied to the sentence at the end of the background-describing sequence. The example of (24) presented above is just the case, repeated below as (46).

- (46) 未希子と二人で乗ったフェリーボートが港に着いた時、もう春だというのに雪が降っていた。それでもカモメ達が海面すれすれを飛んでいた。免許を取ったばかりのぼくは、凍った道をうまく運転できるかどうか、心配していた。

Mikiko to futari de notta feriibooto ga minato ni tsuita toki, moo haru da to iu noni yuki ga hutte ita. Sore de mo kamome-tachi ga kaimen suresure o tonde ita. Menkyo o tatta bakari no boku wa, koota mishi o umaku unten dekiru kadooka, shinpai shite ita.

'When Mikiko and I arrived at the port by ferry, it was snowing in spring. Sea mews were flying just over the sea. I had just obtained a driver's license, so I was worried that I could drive on the frozen road.'

(*Supika to tsuki*, Kenichi Yamakawa)

In (46), the "background" folder is formed in the working memory until a (new) topic *boku* 'I' is introduced.

In conversation, the background-describing sequence appears rarely. In conversation, it is often that the background is the real world the speaker and the hearer live; thus, the speaker need not to describe the world.

5.7 Word-Order Arrangement as an Adjustment of Information-Flow

In this chapter, we have seen that a word order is determined by the interactions of application of grammatical and pragmatic/cognitive order arrangement principles. In the memory storages, the order of pieces of information is irrelevant. The pieces of information are ordered linearly to

speaking or writing in the working memory. How pieces of information are ordered linearly depends on how the speaker/writer adjusts the flow of information. If the speaker/writer tries to introduce a new topic, (s)he tends to pick up an entity in the working memory at a given time, and relate it to a new topic about which (s)he wants to talk or write. This makes the "given information" located sentence-initially. On the other hand, if the speaker/writer tries to talk/write about a certain thing, (s)he keeps the folder formed in the working memory active, and the name of the folder is referred by the least cost anaphoric device (i.e., a zero pronoun). In this case, the "new information" comes first. If the speaker/writer has no special intention of the flow of information, the salient-order arrangement principle is applied by default. In this case, the pieces of information are ordered from the most salient information to the least salient information.

Thus, the word order is not totally "free" in Japanese. A word order is a result of the speaker/writer's adjustment of the flow of information.

Chapter Six

Concluding Remarks

This thesis is about some linguistic forms or constructions relevant to human's information-management mechanism. This is based on the idea that human language is designed as information-managers.

In Chapter One we argued against the distinction between linguistic and extra-linguistic/cultural information. It is hard to distinguish linguistic information from extra-linguistic/cultural information. Linguistic information is a subset of extra-linguistic/cultural information, with fuzzy boundaries. In conversation or reading and writing, the speaker/writer always pays attention to what the hearer/reader knows. However, the speaker/writer cannot know the hearer/reader's knowledge in a direct way. Clark and Marshall (1981) proposed the way that the speaker accesses the evidence which the speaker and hearer can take for granted and calculates the mutual information based on the evidence. We adopted the way of calculation of mutual information proposed by Clark and Marshall, and suggested that some language forms and constructions (particles, anaphoric expressions, and "free" word-order phenomena) are accounted for in the model of information-management.

In Chapter Two we proposed the model of human's memory system and information-management. As human's memory system, we adopted the multiple storage model. Human's memory system is divided into three different levels: working memory, episodic memory, and permanent

semantic memory. Working memory is the level where the information retrieved or coming from the outside-world is processed. The information processed in working memory is stored in episodic memory. The information about conceptual and procedural meaning of lexical items is stored in the permanent semantic memory. We adopted the idea that information-processing is taken as a file-management. In the model of file-management, we proposed the notion of "folder". We assumed that the speaker and hearer form a folder in their working memories in conversation. Introducing a new topic, keeping a topic, or reactivating an old topic are taken as management instructions of folders in working memory.

In Chapter Three we tried to account for some particles in Japanese in the model of information-management, proposed in Chapter Two. The particle *wa* is taken as a folder-activator. The function of *wa* is to reactivate a inactive or decayed folder in working memory. The final particles *ne* and *yo* are sensitive to the calculation to mutual information. The speaker attaches *ne* when (s)he has the evidence to hold mutual information, while (s)he attaches *yo* when (s)he has no evidence to hold mutual information.

Chapter Four treated anaphoric expressions in Japanese. We suggested that anaphoric expressions in Japanese are sensitive to different levels of memory storages. Zero pronouns, *ko*, and *so* are sensitive to working memory, *kare/kanojo* and *a* are sensitive to episodic memory, and bare nouns are sensitive to permanent semantic memory.

In Chapter Five we focused on "free" word-order phenomena in Japanese. The basic idea is that word order is derived from the speaker's adjustment of information-flow. We proposed four principles of the adjustment of information-flow: Given-First Principle, From-Background-to-Foreground

Principle, Salient-Order Arrangement Principle, and Focus-Marking Principle. Salient-Order Arrangement Principle is a default one: that is, if the speaker has no special intentions, word order is arranged from the most salient one to the least salient one. Given-First Principle is sensitive to the state of the speaker's working memory at a given time. The speaker tends to pick up the information in the working memory and to locate it in the sentence-initial position.

The goal I would like to reach is not a theory of what we can say but a theory of how we can say or why we should say so. The former is the "minimalism" approach to human language, the latter is the "maximalism" approach to human language. The goal of mimalism approaches (e.g., the minimalist program by Chomsky) is to discover "linguistic atoms". The minimalists believe, more or less, that human language is "complicated" system composed of linguistic atoms (e.g., features), which cannot be reduced into more minimal items. As experiments in science are made in a laboratory, the minimalists try to describe the content of the brain of "ideal speaker-listener". Chomsky (1965) says:

Linguistic theory is concerned primarily with an ideal speaker-listener, in a completely homogeneous speech-community, who knows its language perfectly and is unaffected by such grammatically irrelevant conditions as memory limitations, distractions, shifts of attention and interest, and errors (random or characteristic) in applying his knowledge of the language in actual performance.

(Chomsky (1965; 3)

Where is an ideal speaker-listener? (S)he is nowhere, because (s)he is an imaginary person. Every person who lives in the real world cannot avoid being affected by various cultural or contextual factors. Even a linguist is not an exception, as long as (s)he lives in the real world. Every linguist is not an ideal speaker-listener. This means that the judgment of a given sentence

may vary from linguist to linguist. It depends on the knowledge of the world where a linguist has so far lived. In fact, in linguistic literature, the judgment of a sentence is not stable; it happens quite often that a linguist judge a sentence as grammatical, while another linguist judge the same sentence as ungrammatical. It is often pointed out (by a non-linguist) that the judgment of linguists is not compatible with that of non-linguists (see Lagana (1988)). The unstableness of judgment among linguists or between linguists and non-linguists shows that it is difficult for real-world residents to reconstruct the ideal speaker-listener's brain.

In this thesis, I have viewed human language from the maximalism approach. Human language is a "complex" system, which is difficult or impossible to reduce into more minimal items. As we discussed in Chapter One, if there is no clear-cut division between linguistic information and extra-linguistic information, we should focus on real forms or constructions of human language which are used in real contexts. Our concern is why we say so in a given context. This would be accounted for by making clear the factors that influence a speaker's choice to say something or the contexts or world surrounding the speaker and hearer.

For four decades, clearer shed has been lighted on human cognitive systems in cognitive science, psychology, ethology, neurology, AI, and so on. Now, even linguists do not ignore the results of these fields. I think, this thesis is a "bridge" between linguistics and non-linguistic approaches to human cognitive systems.

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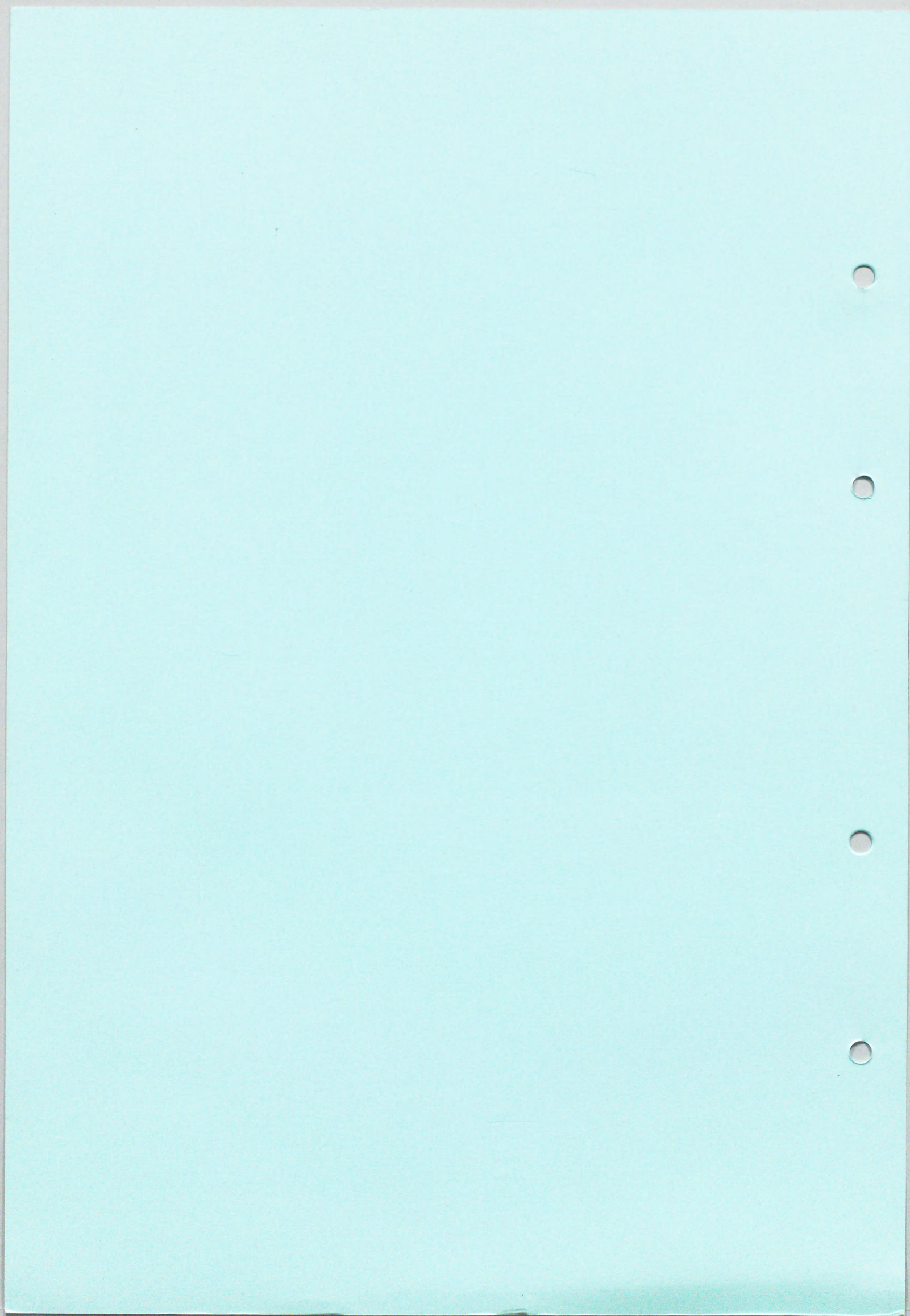
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